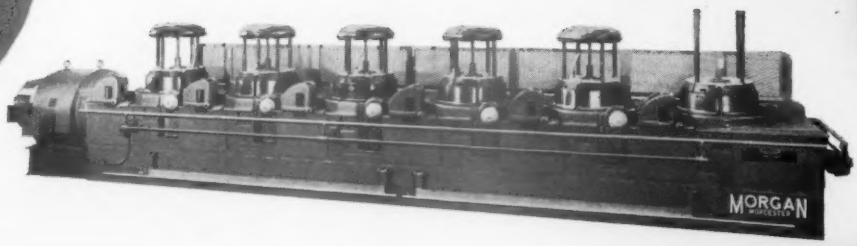
WIRE AND WIRE PRODUCTS

DECEMBER 1957

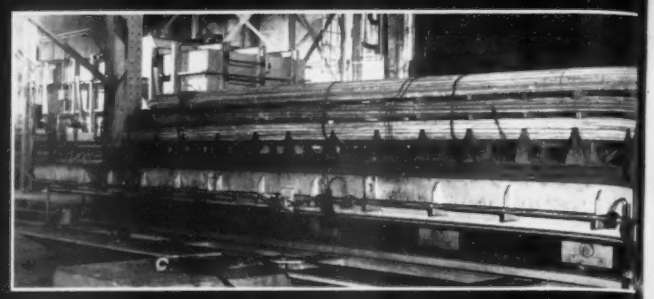
Wishing you
A Very Merry Christmas



***MORGAN-CONNOR** Wire Machines*
Morgan Construction Company
Worcester, Mass.

WM99

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION



A thirty-foot straight bar furnace in operation at Youngstown Sheet and Tube's Briar Hill Plant.

Lee Wilson Merchant Bar Annealing System

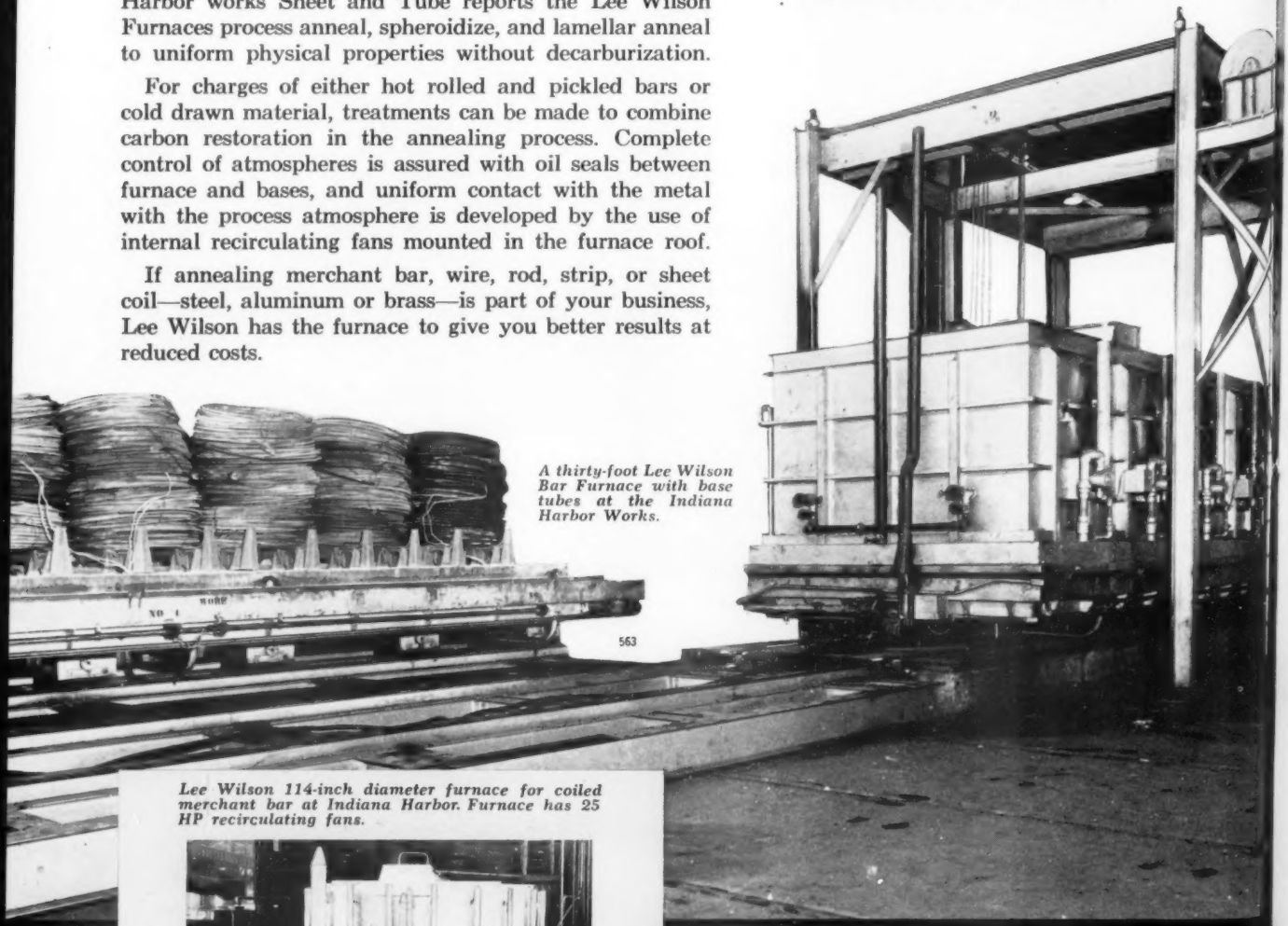
improves properties, finish...reduces costs

... at two Youngstown Sheet and Tube mills

For annealing merchant bar in coils and long straight lengths Youngstown Sheet and Tube found Lee Wilson Radiant Tube Fired, Gas Tight Furnaces deliver the desired results. In both their Youngstown and Indiana Harbor works Sheet and Tube reports the Lee Wilson Furnaces process anneal, spheroidize, and lamellar anneal to uniform physical properties without decarburization.

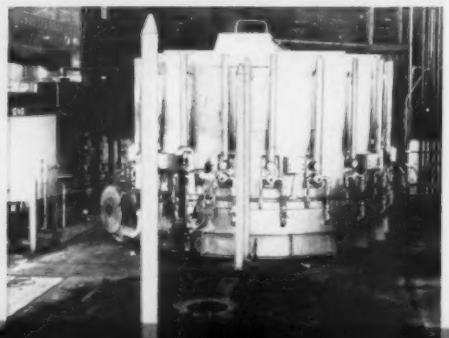
For charges of either hot rolled and pickled bars or cold drawn material, treatments can be made to combine carbon restoration in the annealing process. Complete control of atmospheres is assured with oil seals between furnace and bases, and uniform contact with the metal with the process atmosphere is developed by the use of internal recirculating fans mounted in the furnace roof.

If annealing merchant bar, wire, rod, strip, or sheet coil—steel, aluminum or brass—is part of your business, Lee Wilson has the furnace to give you better results at reduced costs.



A thirty-foot Lee Wilson Bar Furnace with base tubes at the Indiana Harbor Works.

Lee Wilson 114-inch diameter furnace for coiled merchant bar at Indiana Harbor. Furnace has 25 HP recirculating fans.



Lee Wilson* ENGINEERING COMPANY, INC.
20003 WEST LAKE ROAD • CLEVELAND 16, OHIO

HIGH CONVECTION ANNEALING FURNACES
MAKE THE BEST METALS BETTER

Greetings of The Season

At this Season of the Year, when hearts are lighter and the warmth of brotherly love is universal, we of Standard Industrial wish our many, many friends, customers and customers to be, the Merriest of Christmases and a most Prosperous New Year.

It is with a great deal of satisfaction that the Year of 1957 can be reviewed—it has brought us all new friends and successes, yet in spite of some trials, tribulations and, yes, even failures—we can still smile and rejoice.

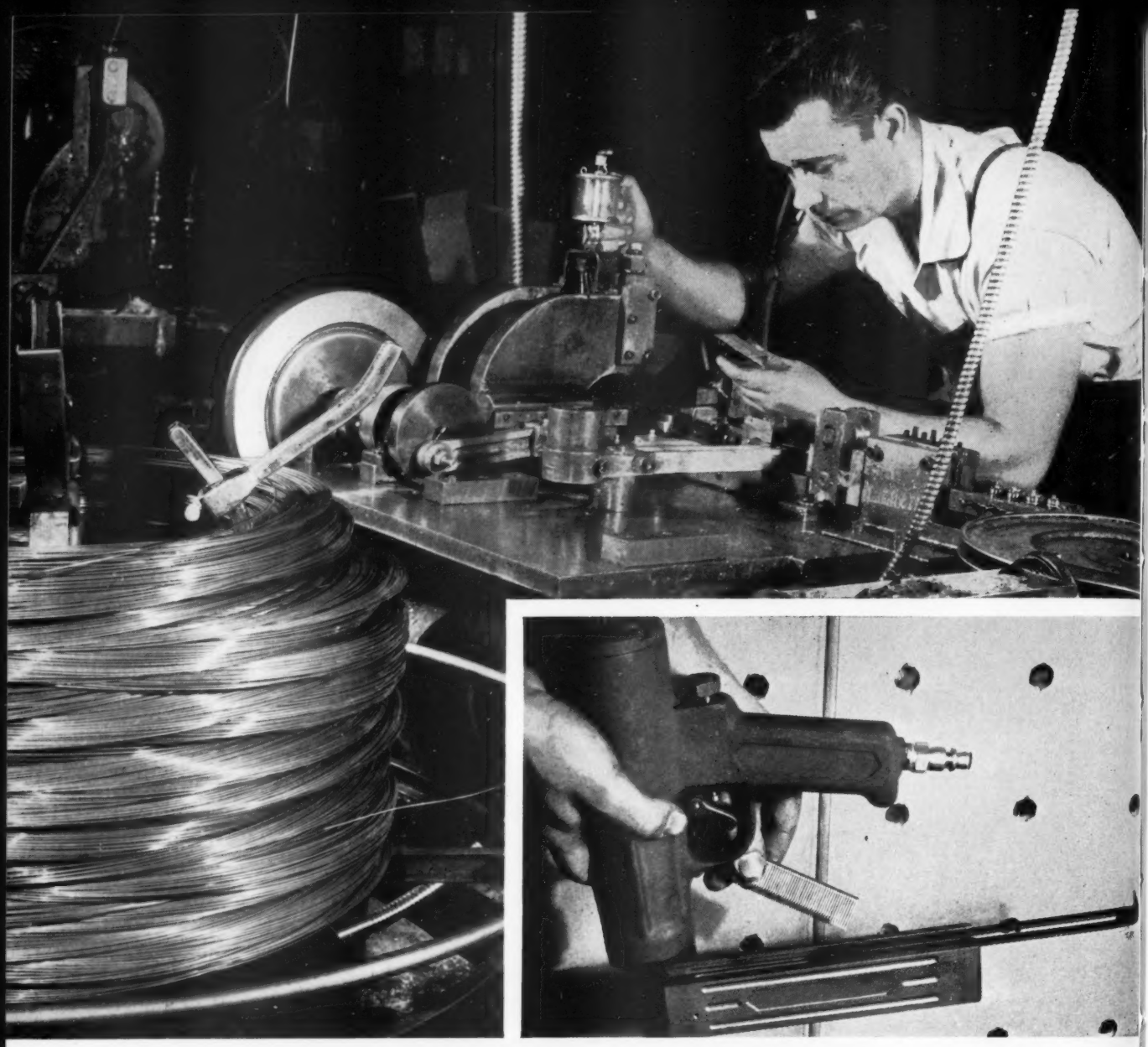
Our best regards to the most wonderful group of men in the world—you wire men! Thank you for your many kindnesses and your unfailing courtesy to us.

Sincerely,

Standard Industrial
COMPOUNDS CO., INC.

FRANKFORT, ILLINOIS
Telephones: 2131-2141

Standard Industrial has pioneered in most of the outstanding contributions to better wire drawing through better lubricants. Consult Standard Industrial for the solution of your difficult problems.



Now you can fasten almost anything with staples shot from guns

Here they're making staples from a coil of Bethlehem 16-ga galvanized steel wire. Not ordinary office-type staples, but big and sturdy industrial staples, ½ in. to 1⅜ in. long, for fastening gypsum and metal lathing. Staples like this can be driven fast with a portable air-gun weighing only about 5 lb.

What a variety of fastening jobs industry is doing with staples these days! They're fastening crates, boxes, bedding, furniture, flooring, siding, roofing, cabinet work. They're even stapling the ribbing on boats!

Producing the right grades of stapling wire, both galvanized and bright, is a familiar task for our modern wire mills. As a matter of fact, Bethlehem turns out steel wire for just about every imaginable use. Some are general purpose grades; others are tailored to meet the requirements of such products as cold-headed screws, upholstery springs, bicycle spokes, lock washers, brush handles, and armor wire for cables.

The steel wire that's best for your product is likely to be a grade and quality we're producing right now. A Bethlehem representative will gladly give you prices, delivery and other details. Just call or write the Bethlehem sales office nearest you. Your inquiry will receive prompt attention.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

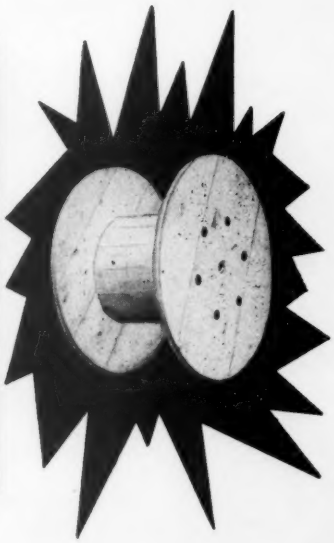
BETHLEHEM STEEL

BETHLEHEM STEEL

YES

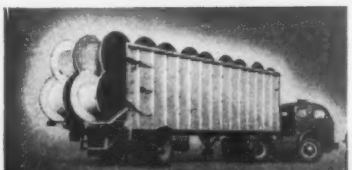
NON-RETURNABLE

WOOD REELS IN ALL SIZES
FOR ALL TYPES OF ELECTRIC
WIRE AND CABLE . . . . . .



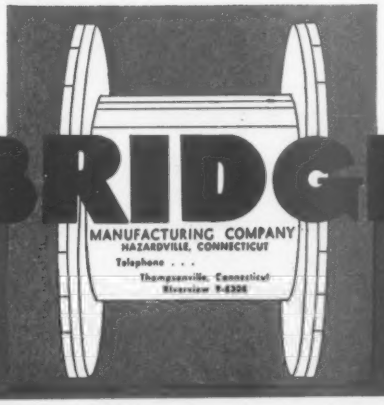
YOU SAVE WITH NON-RETURNABLES

- Reduced Reel Investment
- Less Storage Space
- Lower Freight Costs
- No Repair Costs
- No Return Freight Charges
- No Bookkeeping
- No Deposits Needed
- No More Headaches!!



HIGH-SPEED
SHIPPING SERVICE IN OUR OWN TRUCKS

within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels within a few days east of the Mississippi.



NON-RETURNABLE REELS
GIVE YOU A DEFINITE
PACKAGING COST.

"REEL GOOD . . .

Let us quote on your reel needs. Send us your specifications. Better yet, visit our plant and see how and why Bridge reels are made so well at so low a cost.

WOOD REELS"

THE INSIDE STORY - - - - - -

Wherever wire and cable mills are found, engineers are quick to discover the INSIDE STORY of SYNCRO machinery . . . superior design from research to production line. The inside story is one of production-proved specifications which meet the growing demands for a better product. The Type B-16 Fine Wire Drawing Machine is among many SYNCRO illustrations of better machinery for the wire industry. The SYNCRO B-16 is available with either outboard type arbor or the expanding type as shown above. Several of its outstanding features are:

- **5000 feet per minute operation**
- **Minimum slip for maximum block and die life**
- **Spooler speed transmission assures uniform wire speed throughout the entire spool**
- **Full spool and broken wire automatic shut-down switches**
- **Hard faced draw blocks (optional)**

Consult SYNCRO today for any of your wire and cable mill requirements.

SYNCRO MACHINE COMPANY
Perth Amboy, New Jersey, U.S.A.
affiliated company: WINGET SYNCRO Ltd. Rochester Kent, England

Better Machinery for the Wire Industry

SYNCRO®

WIRE DRAWING MACHINES • DIE STRINGERS • CONTINUOUS ELECTRIC ANNEALERS • PAYOFFS • CAPSTANS • WIRE INSULATORS • HEAVY DUTY TAKEUPS • TAPERS • SPECIAL MACHINERY

WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 32 December, 1957 No. 12

Designated as Official Publication By The Wire Association

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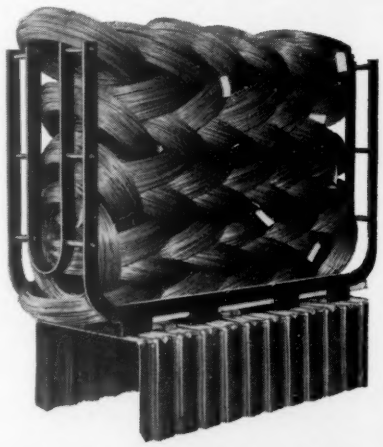
Scott Printing Company, Jersey City 7, New Jersey

NEW IDEA

IN WIRE HANDLING

- Saves Floor Space
- Reduces Costs
- Frees Cluttered Aisles



Republic's new Stack 'N Store Units provide a practical and economical solution to the problem of wire handling.

The units are especially adaptable to bulk material, such as coiled wire, that does not require the use of completely enclosed sides. Specially designed "U" shaped superstructure permits high stacking of coiled wire.

Fully loaded superstructures are handled quickly and easily by crane. Or superstructures may be placed on skids and the entire unit readily moved to a storage area by lift truck.

Republic Stack 'N Store Units save valuable floor space, eliminate cluttered aisles, reduce handling time and costs.

Mail coupon for more information.

REPUBLIC STEEL CORPORATION
DEPT. C-4090 R
3222 EAST 45th STREET • CLEVELAND 27, OHIO

Send more information on Stack 'N Store Units.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

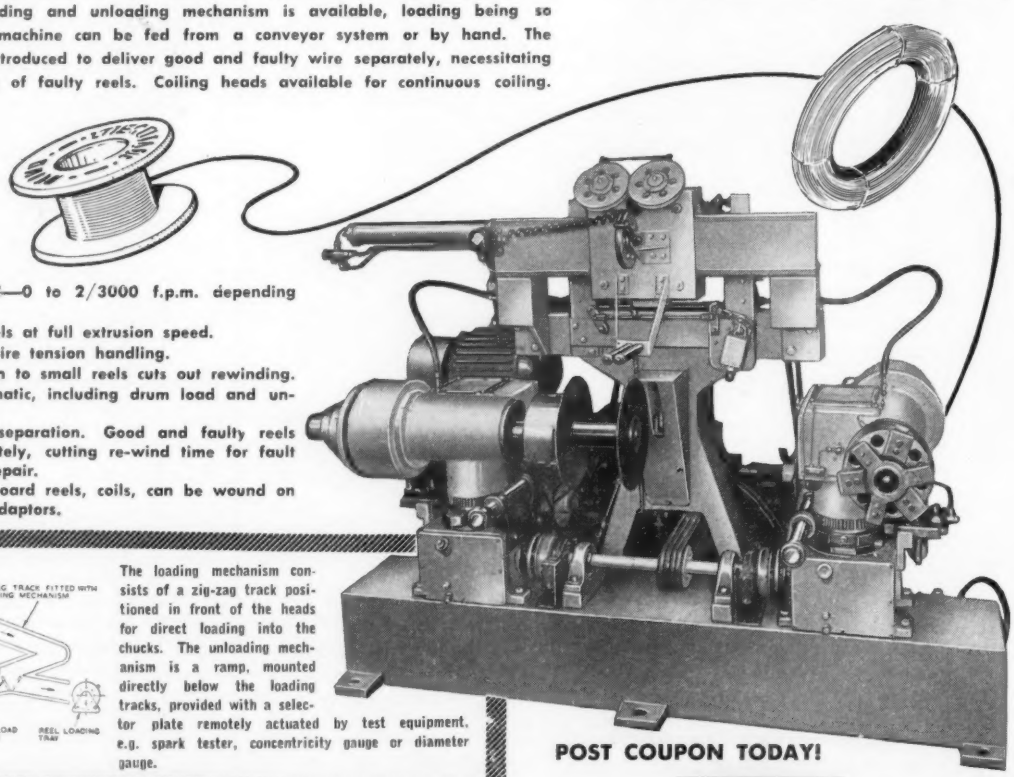
CABLE REELING REVOLUTIONISED!

NEW GENERAL TYPE TA 15 FULLY AUTOMATIC DUAL—REEL TAKE UP.

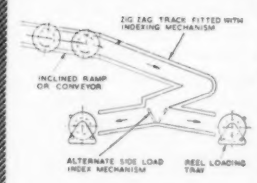
(PATENTS APPLIED FOR IN GREAT BRITAIN AND COUNTRIES ABROAD)

Here is an entirely automatic cable and wire reeling machine specially designed for reeling direct on to small diameter steel or despatch reels—entirely eliminating the operations of rewinding from large to small reels. Suitable for any continuous process, e.g. wire drawing, extruding or continuous vulcanising. 2½ lbs. operates accumulator. Reel speeds up to 2450 r.p.m. 4:1 reel build-up readily handled. A fully automatic loading and unloading mechanism is available, loading being so arranged that the machine can be fed from a conveyor system or by hand. The unloading unit is introduced to deliver good and faulty wire separately, necessitating only the rewinding of faulty reels. Coiling heads available for continuous coiling.

- ★ Continuous coiling
- ★ Continuous winding on to despatch reels
- ★ Continuous winding on to machine reels



- ★ High wire speed—0 to 2/3000 f.p.m. depending on reel size.
- ★ Wire changes reels at full extrusion speed.
- ★ Low controlled wire tension handling.
- ★ Direct winding on to small reels cuts out rewinding.
- ★ Completely automatic, including drum load and unload if required.
- ★ Automatic fault separation. Good and faulty reels delivered separately, cutting re-wind time for fault relocation and repair.
- ★ Steel reels, cardboard reels, coils, can be wound on different chuck adaptors.


ZIG ZAG TRACK FITTED WITH INDEXING MECHANISM
INCLINED RAMP OR CONVEYOR
ALTERNATE SIDE LOAD INDEX MECHANISM
REEL LOADING TRAY

The loading mechanism consists of a zig-zag track positioned in front of the heads for direct loading into the chucks. The unloading mechanism is a ramp, mounted directly below the loading tracks, provided with a selector plate remotely actuated by test equipment, e.g. spark tester, concentricity gauge or diameter gauge.

POST COUPON TODAY!

GENERAL ENGINEERING CO (RADCLIFFE) LTD.

MAKERS OF COMPLETE EXTRUSION LINES AND CABLE PROCESSING PLANT

TO GENERAL ENGINEERING CO. (RADCLIFFE) LTD.
Please send Bulletin T.A. 15 for Fully Automatic Patented Dual reel Take-up.

Name .....

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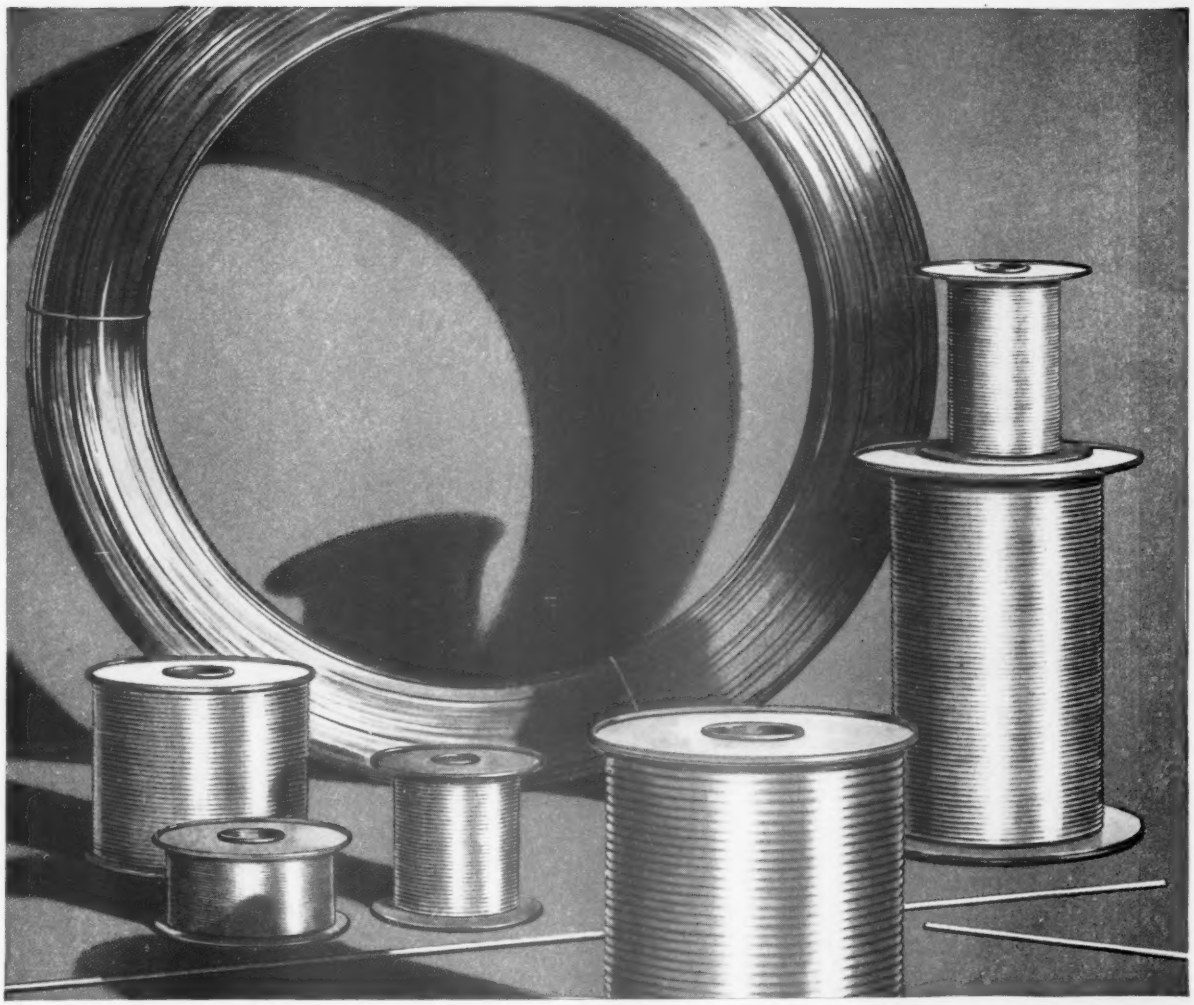


what CRUCIBLE offers stainless wire users . . .

Fuller Selection — Name the type of stainless wire you want and it will be available at Crucible, in the right grade and size. That's true whether you use cold heading, fine, spring, or shape wire. And Crucible stainless wire can be had in a variety of finishes, including bright and several metallic and nonmetallic coatings—full hard to dead soft—centerless ground or polished.

Specialty Mill Quality — You can be *sure* of Crucible quality, for we control every step of production from ore to furnace, to rolling of slabs and billets, to final wire drawing. What's more, Crucible is one of the largest producers of stainless for *all* applications.

Packaging to Fit Your Needs — Crucible regularly uses a wide variety of spools and coils to fit its customer's facilities. All shipments are prepared for best protection, lowest cost, and easiest handling in your plant.

Dependable Delivery — Your nearby Crucible representative can either supply your needs from warehouse stocks, or arrange for prompt mill deliveries. You'll be dealing with a *steelman* qualified to offer sound, practical advice on wire and wire applications, if you ask him for it. And he's backed by the technical service of the nation's largest specialty steel organization. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

For more information, write now for a copy of "Rezistal Stainless Steel Wire." It's a 32-page booklet packed with useful data.

CRUCIBLE first name in special purpose steels

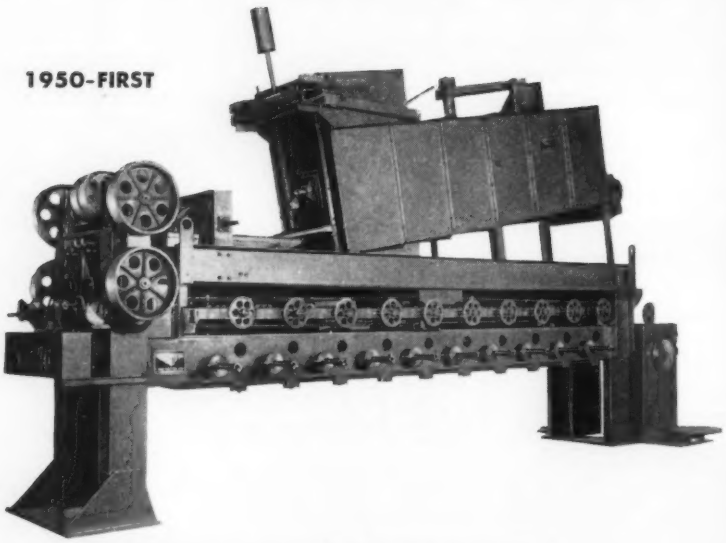
Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.

PROVEN FIRSTS

MODERN PRINCIPLES FOR WIRE PROCESSING

1950-FIRST



SELF-GENERATING ATMOSPHERE ANNEALERS

1950—FIRST to develop and install successful gas-fired recirculating controlled combustion annealing ovens. Shown above mounted on a MOCO dual spooler for tandem operation with wire enameling equipment.

This series of annealers is available for horizontal inclined or vertical mounting positions. No external source of inert atmosphere is needed.

1952-FIRST

VERTICAL WIRE ENAMELING OVENS

1952—FIRST to develop and install a vertical two-zone high velocity axial flow recirculating wire enameling oven with internal recuperative catalytic unit which eliminates condensate and recovers latent solvent energy.

Five other models complete the range from the finest wire through large rectangles. Rapid heat impartation and a high degree of temperature uniformity provide greatly increased production and quality.

WIRE EQUIPMENT DIVISION

MICHIGAN OVEN COMPANY

425 Brainard • Detroit 1, Michigan

For the engineering achievements that keep you competitive—look to MOCO

Why? Because There Is No Substitute For Experience

FOR GREATER OUTPUT—MOCO FEATURES MODERN RECIRCULATING OVENS IN WIRE PROCESSING MACHINES

In the early 1930's radiation type and gravity convection type equipments were replaced by high velocity recirculating atmosphere principles.

This was progression. So were other new principles introduced then or soon after. They made these early ideas as obsolete as the hand cranked automobile.

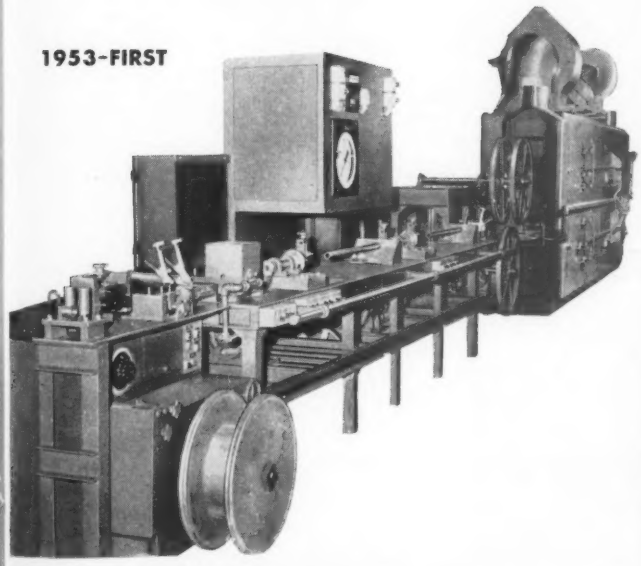
Unfortunately, the builders of wire processing machines did not keep pace with these trends and avoided the expense of remodeling existing machine designs. This forced many wire processing manufacturers to design and build their own equipment—but, of course, without the advantage of continued wide experience in heat processing techniques or of low cost standardization and production procedures.

* * *

On these pages are shown some of the "firsts" which carry the MOCO name plate. Acceptance of these engineering concepts in the wire processing industry has been such that other equipment manufacturers have found it necessary to adopt the same principles.

These "firsts" are evidences of progressive thinking balanced with years of experience—*and of engineering achievements* that have brought to the industry greater production output, higher quality products, and reduced production cost.

1953-FIRST



1956-FIRST

RAPID COOL – VARNISH IMPREGNATING OVENS

1953—FIRST to develop and install rapid cool tunnel type varnish impregnating ovens. Shown above is MOCO's double insulating machine and layer wind takeup. This machine applies two servings of glass or yarn and four coats of baked insulating varnish simultaneously (up to 150,000 C.M. area). Permits wire stoppage without damage to wire in the oven—returns to full production in seconds, because of the rapid rise of temperature in the oven.

REEL-R-DRUM PACKERS

1956—FIRST to develop and install a universal wire packaging machine with combination takeup unit permitting packaging of wire on 6" or 12" diameter spools or in either 100 lb. capacity pails or 500 lb. capacity barrels. Packaging arrangements are optional from spindle to spindle without machine alteration. The complete line accommodates wire sizes ranging from .0130" to .064" in diameter. Speed ranges from 20 to 120 feet per minute.

ANOTHER ENGINEERING ACHIEVEMENT BY

MOCO

For More Details on these Proven Features and Many Others Fill

Please send me complete information on the many outstanding MOCO features:

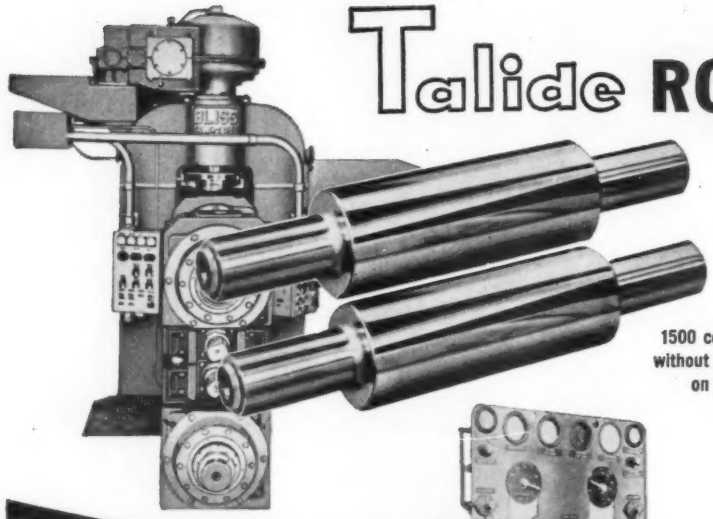
- ☐ Wire Enameling Machines
- ☐ Glass Insulating Machines
- ☐ Other
- ☐ Self-generating atmosphere Annealers
- ☐ Reel-R-Drum Packers

NAME_____ TITLE_____

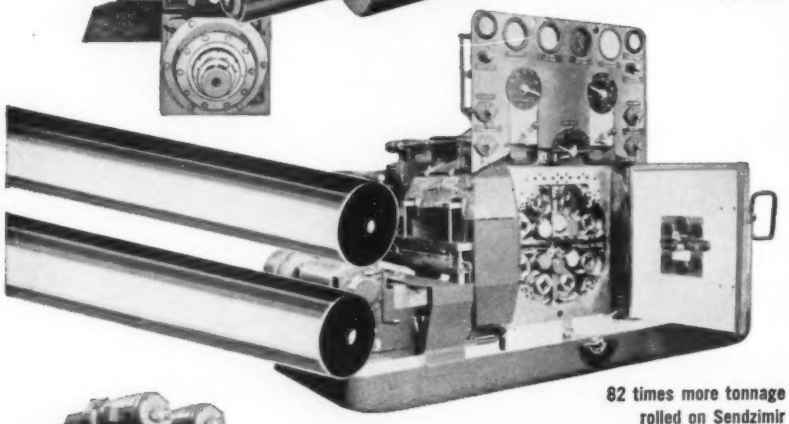
COMPANY_____ ADDRESS_____

CITY_____ ZONE____ STATE_____

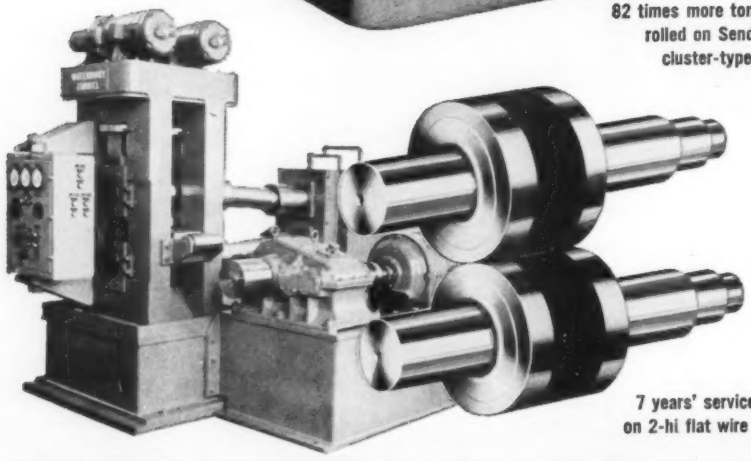
Talide ROLLS OUTLAST ALL OTHERS!



1500 coils rolled without a regrind on 4-hi mill.



82 times more tonnage rolled on Sendzimir cluster-type mill.



7 years' service life on 2-hi flat wire mill.

Talide rolls have proven far superior to both steel rolls and carbide rolls of any other make.

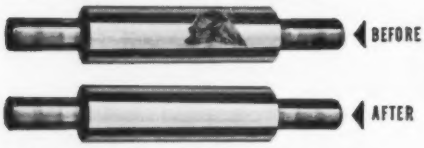
During the last five years Talide rolls have been adopted by every major strip steel producer. Metal Carbides pioneered and developed tungsten carbide rolls and successfully adapted them to all types of rolling mills including STECKEL, BLISS, UNITED, MESTA, STANAT, SENDZIMIR, WATERBURY-FARREL, TORRINGTON, RUESCH, FENN, WEAN, COLD METAL, etc.

Talide work rolls are ultra-hard, extremely dense and porous-free. Manufactured from highest purity tungsten carbide powders, the surface finish of a Talide roll is smoother than one micro-inch. Hard as a diamond, it will take a "bigger bite" than a steel roll. Strip steel of all analyses can be rolled down to thinner gauge, with more accuracy, greater reductions and with fewer anneals than possible with any other roll.

ONLY TALIDE WORK ROLLS GUARANTEE THESE ADVANTAGES

- ★ MORE PRODUCTION
- ★ BETTER FINISH
- ★ LONGER LIFE
- ★ HIGHER SPEEDS
- ★ CLOSER TOLERANCE
- ★ IMPROVED PHYSICALS
- ★ GREATER REDUCTION
- ★ LESS DOWN TIME
- ★ FEWER REJECTS
- ★ LESS MAINTENANCE

EXCLUSIVE REPAIR SERVICE



Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Talide Rolls are made in lengths up to 100", diameters up to 25", and up to 5000 lbs. by weight.

Metal Carbides Corporation,
Youngstown 12, Ohio.

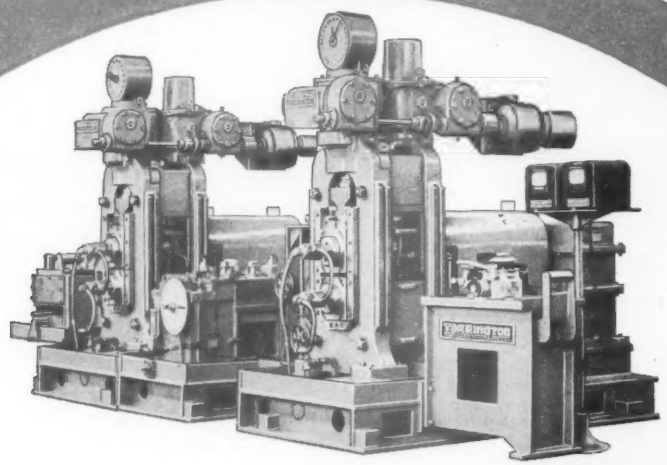
Send for new 76-page catalog 56-G

SUPERSET GRINDING WHEEL

The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-8 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter

METAL CARBIDES CORPORATION
TALIDE®
YOUNGSTOWN 12, OHIO
HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

YOU CAN LOWER WIRE ROLLING COSTS



...with a Torrington Flat Wire Mill

SPEEDED PRODUCTION — Torrington Flat Wire Mills achieve finishing speeds up to 3500 FPM.

GREATER ACCURACY — Processed wire can be held to tolerances of .00025″ in thickness and .0005″ in width. Automatic magnetic gauges eliminate waste.

FLEXIBILITY — Combination of two or three flattening stands, with edgers, can accommodate wide variety of work.

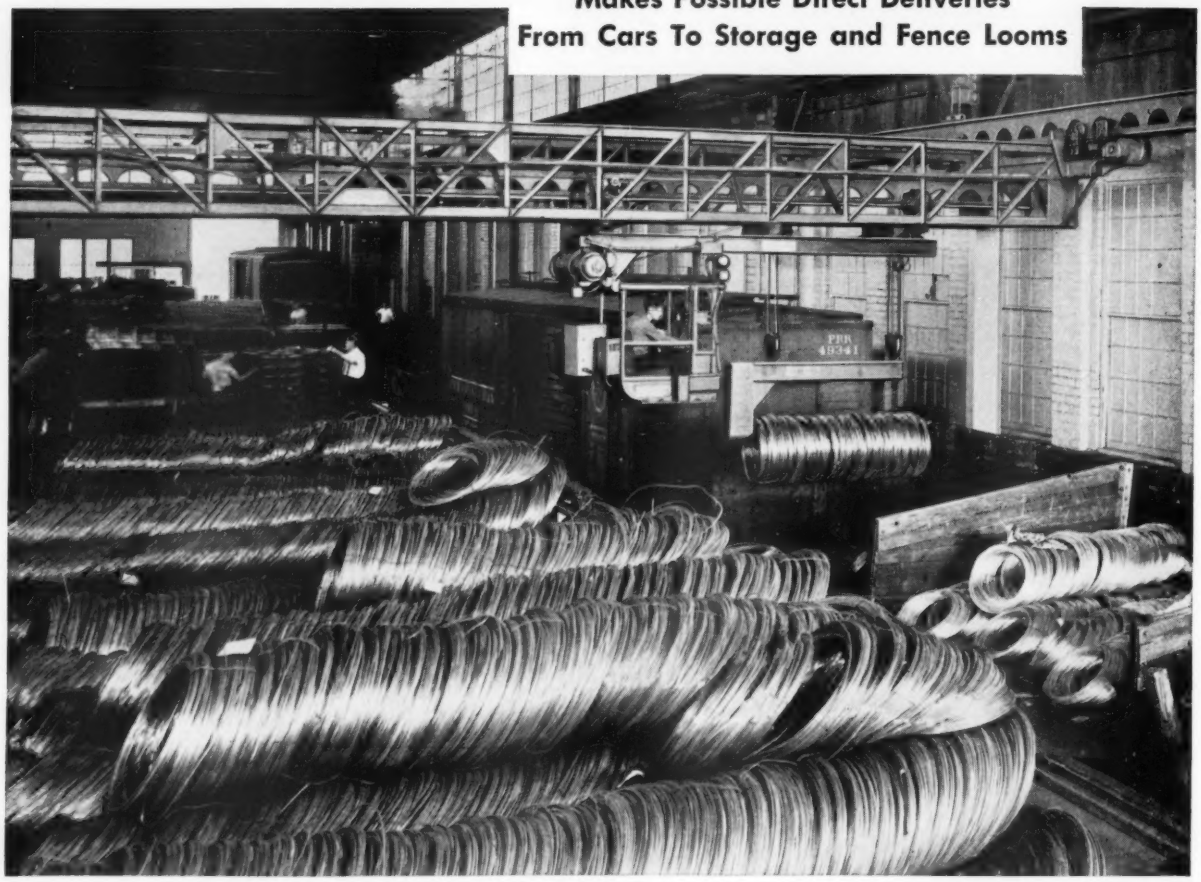
DEPENDABILITY — Torrington machines are ruggedly built for years of repair-free service. Easy access to flattening rolls and other major components greatly reduces downtime for maintenance, adjustment and threading.

COMPLETE ENGINEERING SERVICE — Auxiliary mill machinery should be selected only after thorough consultation with experienced engineers. Torrington's engineering staff, backed by the knowledge and skill gained while serving the metal mills for nearly 70 years, will work with you to provide machinery best fitted to your needs. For full information, call or write: Mill Machinery Division, Torrington Manufacturing Company, Torrington, Conn.

THE
TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT
VAN NUYS, CALIFORNIA · OAKVILLE, ONTARIO

Transfer Crane Speeds Wire Handling

Makes Possible Direct Deliveries From Cars To Storage and Fence Looms



3300 lb. loads of wire are picked up from specially arranged flat cars and placed in storage or delivered directly to fence and road-mesh looms located in various parts of a building with a Cleveland Tramrail overhead handling system.

An important part of the system is a 52'-0" span transfer crane which operates over the railroad track and the large storage area for the full length of the building. The crane is designed with double truss girders which give it great rigidity and strength. This construction has the advantage of light weight and permits interlocking with the track system.

Handling costs are extremely low because the operator in the cab carrier, without floor assistants, can move vast tonnages simply by manipulating controllers in his cab. These permit him to lower, raise and thread the hairpin hook into and out of wire coils, operate the crane on its runway and travel the carrier to all points on the entire track and switch system.

Cleveland Tramrail is playing an important role throughout the wire and rod industry. For any problems on handling, cleaning, drawing, or block-stripping, your inquiries are invited.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
9221 EAST 288TH STREET WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

WIRE TAKEUP FRAME for galvanized wires of 40 stationary blocks, installed above floor level for processing of large coil weights.

WILHELM BREITENBACH
Maschinenfabrik
und Eisengießerei GmbH
UNNA / Westfalen
Western Germany

BREITENBACH · UNNA

Exclusive Representatives for U.S.A. and Canada
Jedwin of Canada Limited, 170 Bloor Street West, Toronto, Ontario, Canada
Telephone: WA. 1-3147

With

NOPCO® KLY

a liquid fine wire drawing lubricant

Be sure to try Nopco KLY next time you're drawing fine size steel or fine and intermediate size copper wire. It's *different*—and everything different about it you'll find is a big advantage.

First, this emulsifiable oil mixes quickly and completely with water—hot or cold. This feature alone is enough to make it ace-high with you. But it has other advantages equally important.

Your bath lasts longer. Nopco KLY has a built-in affinity for water. Its lubricants stay *uniformly active* much longer, since the "drag out" of the lubricants from the solution is reduced beyond anything you've ever seen.

Prevents Formation of Insoluble Copper and Lime Soaps—both the copper soaps, which score dies, clog feed lines and screens; and the lime soaps you've been bothered with when drawing lime coated steel wire.

KLY may be used for high carbon, low carbon, limed, galvanized, and liquor finished fine steel wire—also for fine and intermediate copper, bronze, and brass wire. You'll surely want to try this die-saving, cost-saving lubricant soon. Write today for free booklet "Nopco KLY", which gives full instructions, lists percentages of fat in all emulsions.
Nopco Chemical Company,
Harrison, N. J.

YOU MIX IT FASTER, EASIER

YOUR BATH LASTS LONGER

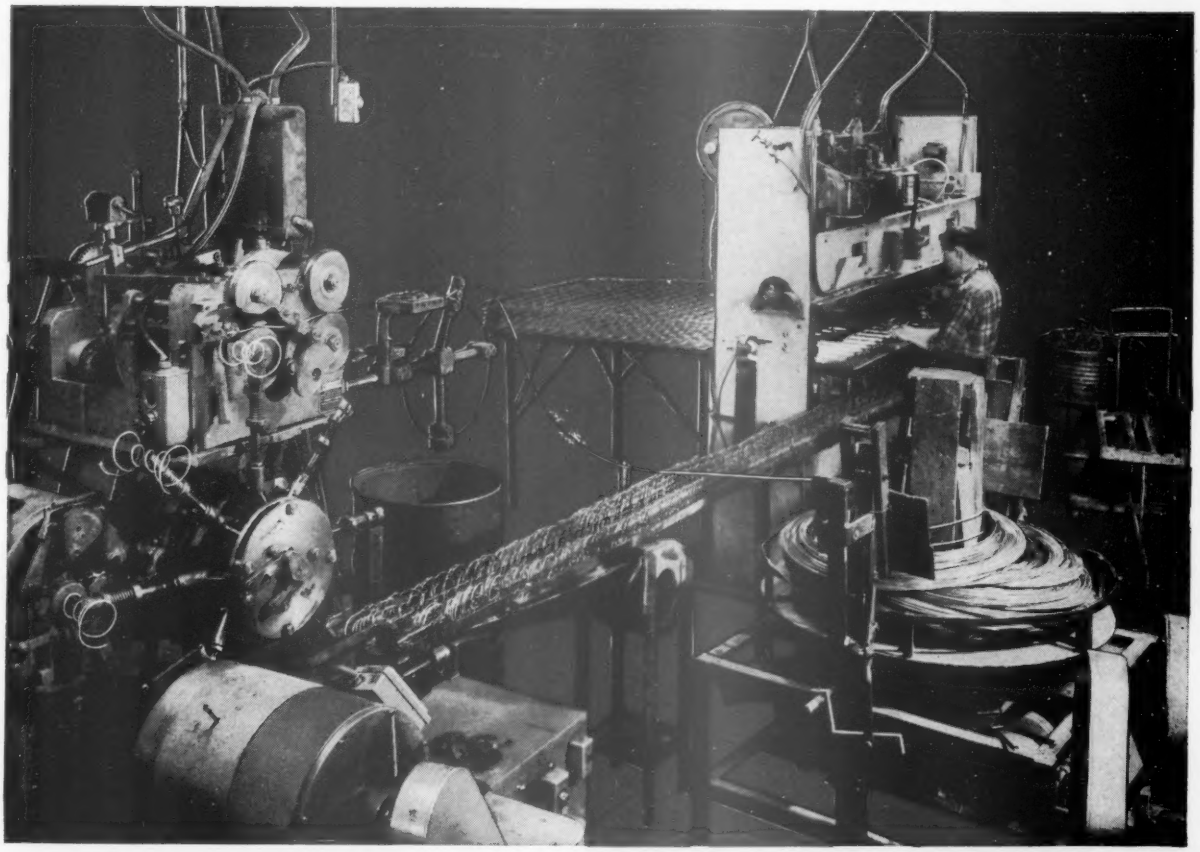
YOU GET UNIFORMLY ACTIVE LUBRICATION

1907–1957 *50 Years* OF PROGRESS IN CHEMISTRY

NOPCO

PLANTS: Harrison, N. J.
Cedartown, Ga. • Richmond, Calif.
London, Canada

Double cone springs are produced automatically on this Wunderlich special high speed automatic coiling and knotting machine at the Sealy Mattress Company, Cleveland, Ohio. Machine coils, crimps, knots and heat treats springs made from 13½ gage Mastercraft spring wire, supplied in 600 lb. bundles.



UNIFORMITY OF J&L WIRE

speeds spring production

J&L spring wire reduces number of rejects, increases production, in modern automatic operations. One reason is that every bundle of spring wire is produced to closely controlled tolerances.

Rigid quality control assures uniform physical and dimensional characteristics. Every coil of famous Mastercraft, hard-drawn MB or Electromatic oil-tempered MB spring wire is thoroughly tested.

Try this superior Jones & Laughlin spring wire. You'll find it's tops in quality, competitive in price.

Call your J&L representative or write to the Jones & Laughlin Steel Corporation, Dept. 448, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

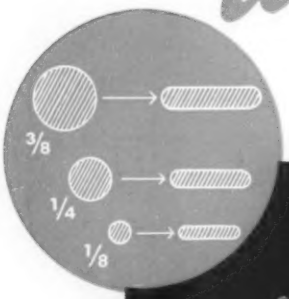
Jones & Laughlin STEEL ...a great name in steel

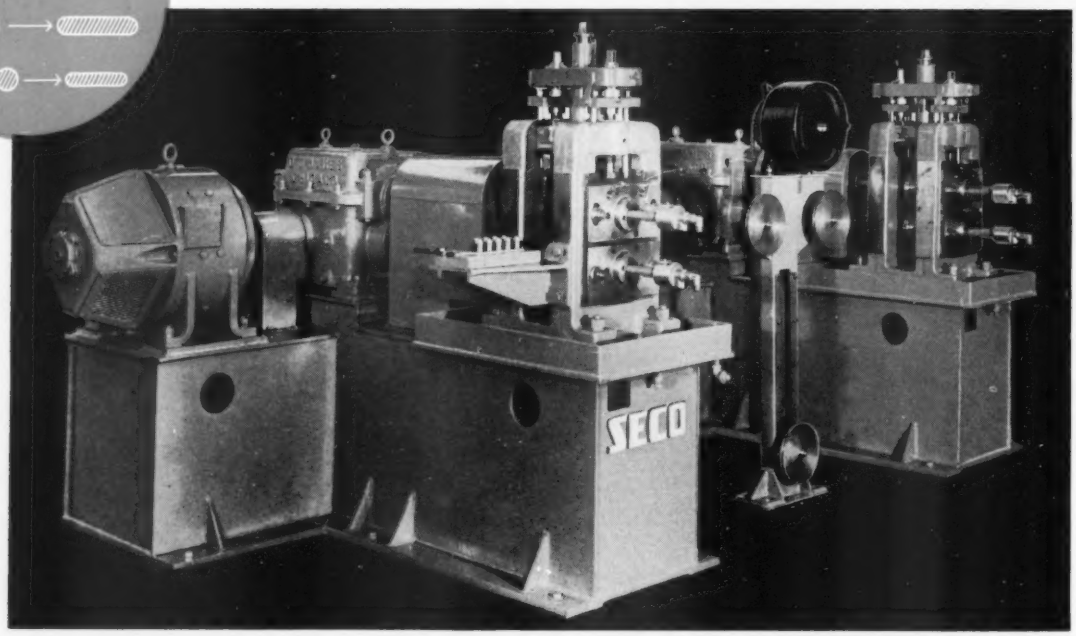
SECO

When You See SECO You're Seeing the Best!

Wire FLATTENING MILLS

Meet Today's High Standards of Quality and Efficient Operation





Shown above is the SECO 6" Tandem Mill with carboloy rolls and Timken Tapered Roller Bearings. Speed range is from 200 to 800 fpm. The mills are driven by DC motors through combination worm-helical reducers with universal joints, for silent and vibrationless operation. 8" and 10" mills of the same design and construction are also available. Suitable traverse reels are furnished.

Call or write for information and complete data. Consultation invited — no obligation.

STEEL EQUIPMENT COMPANY
P. O. BOX 737, WARRENSVILLE STATION
CLEVELAND 22, OHIO

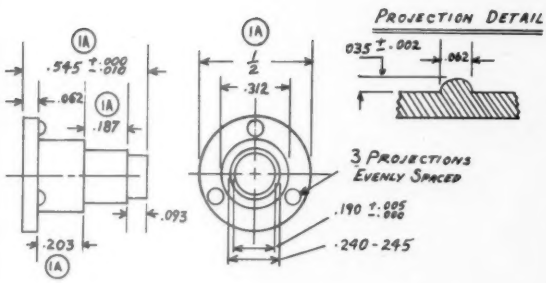
SECO

from 5 Expensive Operations to—

2 blows!

KEYSTONE XL WIRE STUDY

3.5 TIMES ACTUAL SIZE



Shaft for nylon rollers used in cabinet drawers. The blank formerly was made in 4 cuts on a screw machine — then the 3 tiny projections which anchor the nylon rollers were spot welded. Now Milford cold heads the part from Keystone "XL" Wire with one secondary operation to turn the small tenon. The two major shoulder diameters, head and projection, are produced in just two blows.

MILFORD RIVET

The MILFORD RIVET & MACHINE CO. finds Keystone Wire saves 70% in Costs . . . 85% in Time

Here is a typical example of how Milford uses Keystone "XL" Wire in meeting difficult cold upsetting requirements. Milford estimates that savings of 70% in cost and 85% in time have been effected by cold heading the part illustrated above as compared with the four operations it formerly took on a screw machine plus spot welding. Milford puts Keystone "XL" Wire to work at its five plants — Elyria, Ohio; Milford, Conn.; Hatboro, Pa.; Aurora, Ill.; and Norwalk, Calif. Milford recognizes *flowability* of Keystone "XL" Wire as the key to profitable runs of quality fasteners.

Manufacturers come to Milford with specific fastener requirements — then skilled Milford engineers design quality cold-formed parts. Here's where *teamwork* pays off. Milford and Keystone representatives find the most practical solution to metallurgical problems. This results in high quality — yet economical parts — fabricated perfectly for the job they were designed to do.

Close counsel and analysis of your wire problems are services you receive from your Keystone representative. Call him today!

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

Keystone Steel & Wire Company
Peoria 7, Illinois

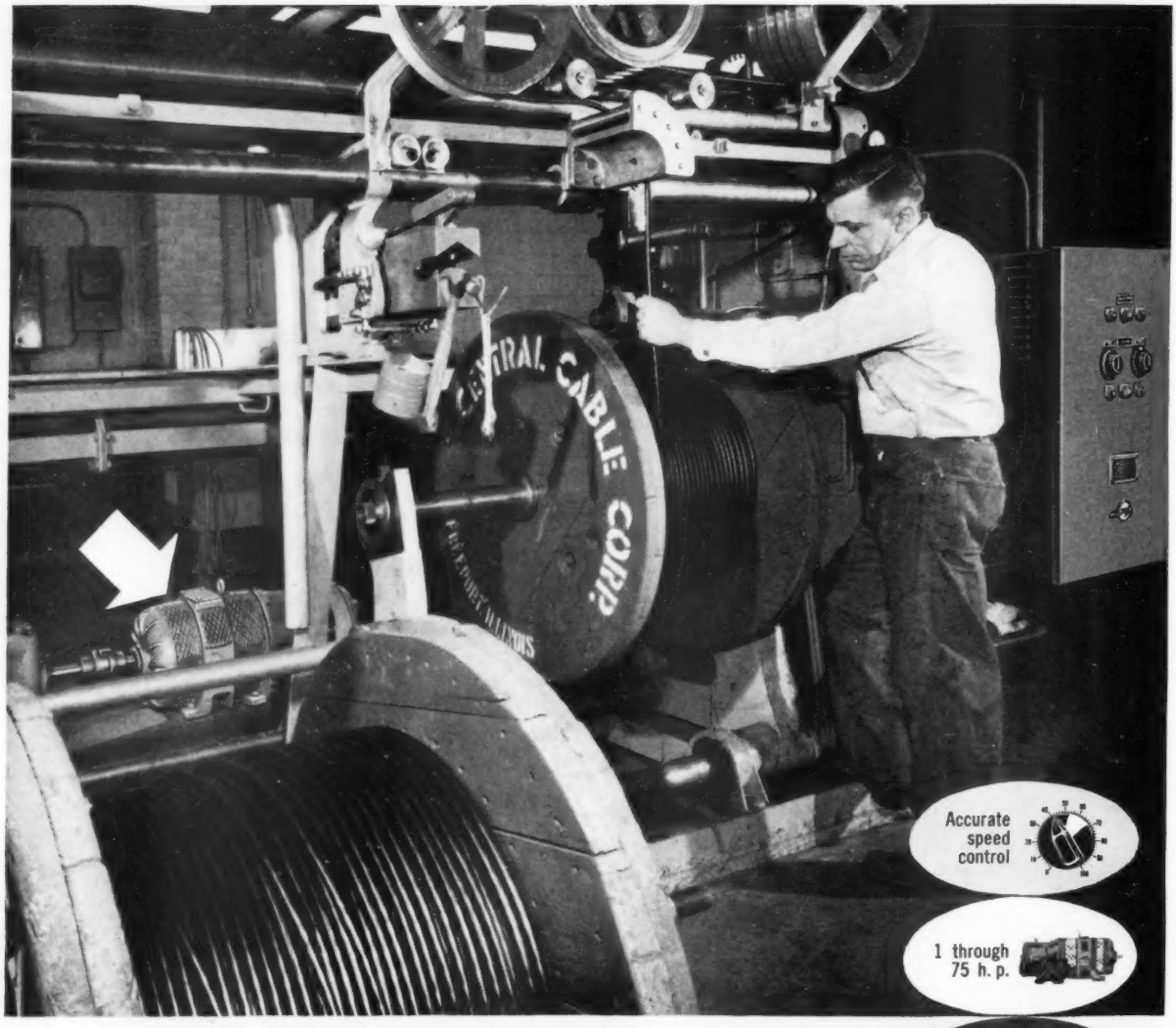
Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____



How to get higher wire production at lower cost:

Louis Allis provides dependable A. C. adjustable speed drives for wire lines

Here's a dependable tip for boosting production on any continuous extrusion line producing rubber or plastic insulated wire: Louis Allis Ajusto-Spede® can give you simple control of your wire-line process that will assure proper tension on the wire, plus correct relative speed of wire and plastic flow into the die at all times.

The result? Wire coated to a dimensional accuracy that will meet the most rigid specifications . . . produced with excellent uniformity at a high output rate, and with the minimum of scrap.

Louis Allis controls give you "one-dial" master speed control to assure proper synchronization between extruder, capstan, and take-up.

The proof lies in the many successful Louis Allis wire-processing installations. There's a Louis Allis sales engineer in your area who'll gladly give you their names, and who can give you expert advice on the correct drives for powering *your* wire line.

Contact your nearby Louis Allis District Office or write The Louis Allis Co., 451 East Stewart Street, Milwaukee 1, Wisconsin.

LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

NEW ENTWISTLE HIGH SPEED AUTOMATIC SHAFTLESS TAKE-UPS

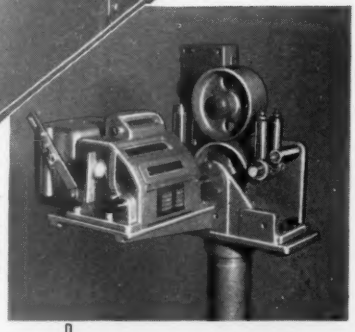
- **Speeds up to 4000 F.P.M. on wire down to No. 26 A.W.G.**
- **Completely Automatic Wire Transfer.**
- **Individual drive motor for each reel.**
- **Available in standard models of 18", 24", 36" maximum reel diameter.**

Your extruder or continuous vulcanizing line will reach a new high in speed and efficiency with a completely new Entwistle High Speed Automatic Shaftless Take-Up. This unit permits continuous take-up in speeds up to 4000 F.P.M. on wire sizes down to No. 26 A.W.G. with maintained wire tension.

Rapid transfer to the second reel can be accomplished automatically from counter signal or by manually operated push button. Pneumatically operated side arms make loading and unloading a simple, easy operation. Hydraulic traverse is infinitely adjustable over a wide range.

Powered cutter for insulated wire sizes up to 5/8" diameter can be supplied on 24" and 36" models. Hydraulic lifting ramps and four speed transmission supplied on 36" model.

Find out what the NEW Entwistle High Speed Automatic Shaftless Take-Up can do for your extruding operations. Write or phone for complete details.



High speed predetermining, automatic resetting, open face measuring machine furnished with each unit.

ENTWISTLE

Manufacturing Corporation

1475 ELMWOOD AVE., PROVIDENCE 7, RHODE ISLAND

Over 40 years of dependable service to the Wire Industry

Are **YOU** *Represented in the*

WIRE AND WIRE PRODUCTS BUYERS' GUIDE?

The 1958 Edition of this Annual Directory is now being prepared for publication.

Your ADVERTISING MESSAGE in it will provide your company with a point-of-purchase contact with your customers and prospective customers when they are in the market to buy.

If YOU have not sent in an order for advertising space, you are urged to do so immediately, as advertising forms close on January 25th.

The BUYERS' GUIDE is the only directory published in this country for the Wire Industry.

It is widely used by wire men when information on sources of supply are being investigated. Your advertising will help a buyer to decide in your favor by supplying exact information that cannot be secured from the mere listing of your name.

This is the last call before closing date.

If you do not have the advertising rates and space sizes on file, they will be sent upon request by return mail. Such advertising pays and we hope to have you as an advertiser in the 1958 BUYERS' GUIDE.

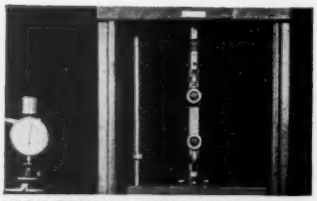
Write today to

WIRE and WIRE PRODUCTS

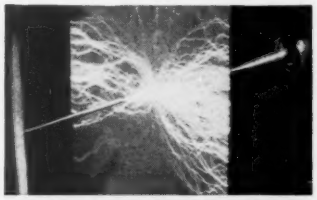
J. EDWARD DONNELLAN, ***Vice President***

453 MAIN STREET **STAMFORD, CONN.**

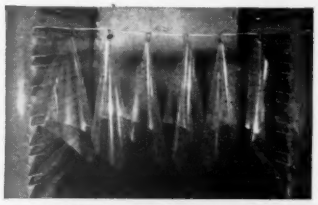
"MYLAR" offers a unique combination of properties valuable for electrical design



HIGH TENSILE STRENGTH. "Mylar" is the strongest plastic film. Instron tester shows an average strength of 20,000 lbs. psi.



HIGH DIELECTRIC STRENGTH. Average of 4,000 volts per mil . . . average power factor of 0.003 to 60 cycles . . . dielectric constant above 3.0 at 72°F., 1,000 cycles.



THERMAL STABILITY. "Mylar" has an effective operating range from -80° to 300°F. . . . won't become brittle with age.

Core binder tape made with Du Pont MYLAR® helps Western Electric speed production of communication cable

PROBLEM: Western Electric's new long-life, high-dielectric communications cable posed a challenging problem for production engineers. The problem was this—how to efficiently extrude an outer jacket of polyethylene without fusing the inner pairs of wires also coated with polyethylene.

SOLUTION: After extensive tests with combinations of materials, a tape of Du Pont "Mylar"* polyester film and rubber was selected to act as a heat barrier.

RESULTS: Western Electric reports that abrasion-resistant "Mylar", with its hard, durable surface, helps the core binder tape run smoothly on its equipment without snagging or tearing. Because of its high tensile strength and melting point, "Mylar" helps prevent corrugations of the electrostatic aluminum shield from breaking through the tape and shorting the cable.

HOW CAN "MYLAR" HELP YOU? Whether you make guided missiles or tiny components, you may be able to capitalize on the outstanding combination of properties found in tough, transparent "Mylar" film. For a booklet containing technical data plus information on successful applications, send in the coupon below.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT **MYLAR®** POLYESTER FILM

*"MYLAR" is Du Pont's registered trademark for its brand of polyester film.

E. I. du Pont de Nemours & Co. (Inc.)
Film Dept., Room EG-12, Nemours Bldg., Wilmington 98, Del.
Please send the new booklet listing properties, applications and types of "Mylar" polyester film available (MB-11).

Application_____

Name_____ Title_____

Company_____

Address_____

City_____ State_____

Yes, we have Firthaloy Carbide NAIL DIE INSERTS

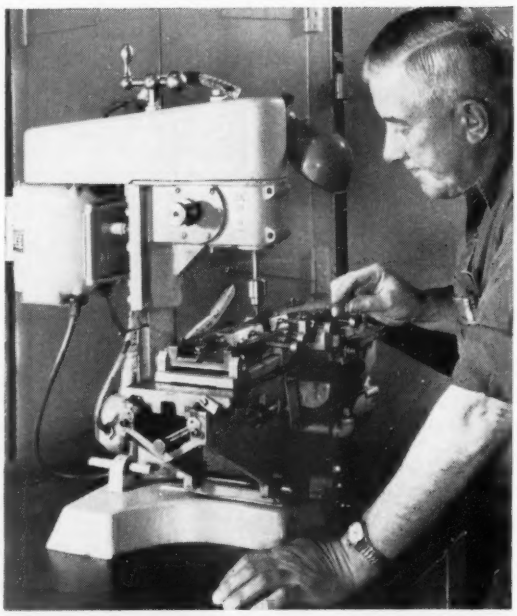
Firthaloy Nail and Tack Die inserts are available from warehouse and distributor stocks in 8 sizes covering the complete range of nail tooling needs. Standards NT-1 to NT-8, specifications for which are shown below, are furnished unground. Ground inserts or sizes or grades other than standard are furnished upon request, of course.

Firth Sterling pioneered the development of sintered carbides for nail and tack tooling. Firth Sterling also designed and developed the only nail die barbing machine available to industry. The combination of high production Firthaloy nibs and Firth Sterling tool room finishing equipment assures lowest die cost with maximum production.

SPECIFICATIONS

INSERT NUMBER	DIMENSIONS				GRAM WEIGHT
	T	W	L	R	
NT-1	3/8	3/8	7/16	3/16	14.77
NT-2	7/16	7/16	9/16	7/32	25.84
NT-3	1/2	1/2	11/16	1/4	41.25
NT-4	5/8	5/8	3/4	5/16	70.30
NT-5	11/16	11/16	13/16	11/32	92.18
NT-6	3/4	3/4	3/4	3/8	101.25
NT-7	15/16	7/8	1	7/16	196.87
NT-8	1 1/16	1 1/8	1 1/8	9/16	322.73

Stocked in Grade ND-25



This Firthaloy Nail Die Barbing Machine in use at Pittsburgh Steel Company is familiar equipment in nearly every nail plant tool room in the country. For further information and prices on this modern aid to better production, contact your nearest Firth Sterling District Office.

R-333

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS: McKEESPORT, TRAFFORD, DETROIT, HOUSTON, WEST HARTFORD, YONKERS
OFFICES AND WAREHOUSES*: BIRMINGHAM CHICAGO* CLEVELAND* DAYTON DETROIT*
WEST HARTFORD* HOUSTON* LOS ANGELES* PITTSBURGH* WESTFIELD N.J.

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool and Die Steels
Stainless Specialties
High Temperature Alloys

Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets

Zirconium

NAUGATUCK Marvinol

4 PVC resins for electrical application

1 MARVINOL® VR-22
A medium-high-molecular-weight resin for hot dry-blend extrusion. Has excellent electrical properties, *high tensile* and *elongation*, outstanding *abrasion resistance*, and inherent heat stability. Approved by the Underwriters' Laboratories, Inc., for electrical applications.

2 MARVINOL VR-23
A medium-molecular-weight, easy-processing resin for hot dry-blend extrusion. Gives fast extrusion rates at low power consumption. Has superior electrical properties and excellent heat stability. Wire extruders report that Marvinol VR-23 makes *whiter* compounds. Approved by Underwriters' Laboratories, Inc.

3 MARVINOL VR-24
A medium-low-molecular-weight, easy-processing resin with very high bulk density. Useful in *semi-rigid* compounds for insulation of low-voltage and communications wiring.

4 MARVINOL VR-25
A low-molecular-weight resin ideally suited to unmodified *rigid* PVC electrical applications.

United States Rubber
Naugatuck Chemical Division, NAUGATUCK, CONNECTICUT
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices

BRANCHES: Akron • Boston • Gastonia, N. C. • Chicago • Los Angeles • Memphis • New York • Philadelphia • CANADA: Naugatuck Chemicals, Elmira, Ont. • CABLE: Rubexport, N.Y.

Brush wire, crimped (as shown) or straight, now produced in multiple strand, and furnished in coils or straight hanks depending on wire size.

How a **new idea in wire** *cleaned up a brush production problem*

• Maybe you can profit by the kind of interest and action applied to customers' problems by the Worcester Wire Works Division of National-Standard. Take wire brush manufacture for example . . .

Until recently, brush manufacturers had to cut through a coil of wire, then gather by hand and by guesswork the approximate number of wires for the type of brush in production. Naturally this involved a lot of cut-off waste, plus the wire lost through faulty guesswork.

Now, to overcome this waste, Worcester Wire Works has developed ways to produce and furnish wire in predetermined bunches (up to 400 wires per bunch) with *exactly* the right number of wires for a given brush. Much costly loss is eliminated, more brushes are produced per pound of wire, and production is speeded.

The point is, Worcester Wire Works people specialize in more than quality wire. They also specialize in the kind of service and exploration that time and again cuts costs for customers. Better check with them on your wire needs. You'll like the way they do business.

NATIONAL NS NATIONAL-STANDARD Company NILES, MICHIGAN **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

You name your wire production needs . . .

and LET **Vaughn®**

PROVIDE THE ENGINEERED ANSWER

VAUGHN TRIPLEX MOTOBLOX®

VAUGHN MOTOBLOC®

VAUGHN RINGBLOX®

A Vaughn consultation on your forthcoming wire production requirements can point the way to profits! Our complete resources are at your disposal—our experience is your assurance of constructive help. *Call us, without obligation of any kind.*

The VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO U.S.A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

Telephone installations show...

How Polyethylene performs in the field

WASHINGTON – Polyethylene-covered cable was first installed in this mountainous region of the Pacific Northwest in 1950. Field experience showed that it was adaptable to any method of hanging and required no special equipment. Installation could be made on existing pole arms without increasing crossarms, pole height, or tree trimming.

The line has withstood extremely heavy snow and ice loading in certain mountain and valley sections. There has been no deterioration despite temperatures 40 deg. below zero. During the summer months, temperatures up to 115 deg. and exposure to sunlight have had no discernible effect.

NEW YORK – Recently, 33,000 feet of cable and 75,000 feet of wire, both insulated with polyethylene, were put into service in upstate New York. Although an unusually large number of thunderstorms were experienced during the year, no lightning damage was reported on these lines. To date, rain conditions have had no effect.

Much of the cable was strung on existing poles, but in the construction of new lines it was found practical to use ⅓ fewer poles. The need for crossarms and tree trimming was also reduced. As a result, maintenance costs in rural areas have stayed low.

YEARS of service under a variety of terrain and climatic conditions are represented by these field reports from the telephone industry. They describe the performance of BAKELITE Brand Polyethylene used as jacketing and insulation for wire and cable.

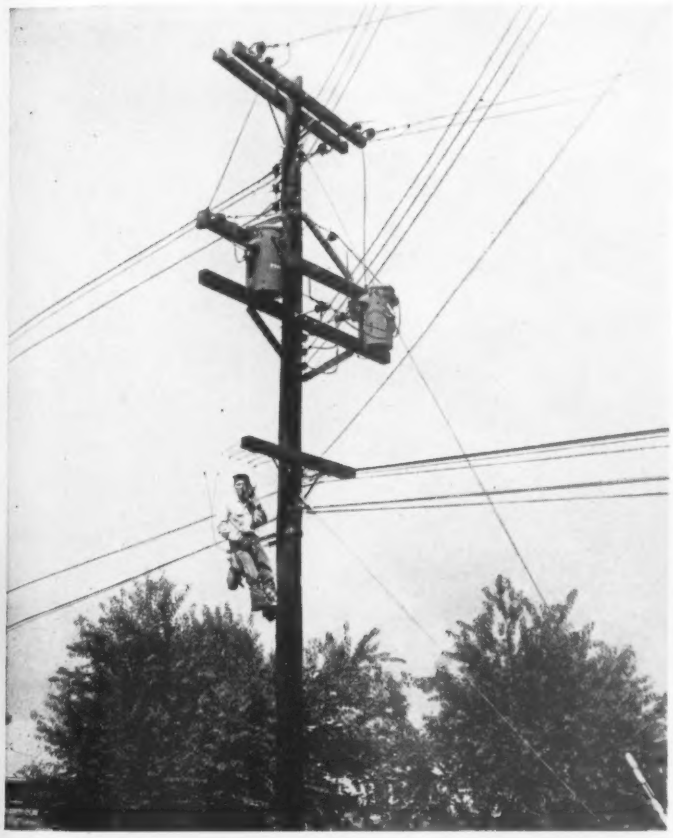
In every instance, BAKELITE Polyethylene has brought improvements over conventional materials. Its superior moisture resistance has set a new standard in trouble-free operation. Its extremely light weight has saved time and expense in installation. Its toughness has made cable handling easier. Its excellent dielectric strength has far exceeded the needs of telephone service.

The growing acceptance of this material is shown by its use in coaxial cable and signal control cable as well as telephone line wire. BAKELITE Polyethylene satisfies REA requirements for plastic-covered telephone wire, IPCEA specifications for power cable, ASA standards for weatherproof wire, ASTM D1238-52T Type II, dielectric materials, and IMSA specifications for fire alarm and signal control cable. For more information, write Dept. AT-196.

BAKELITE
BRAND
POLYETHYLENE

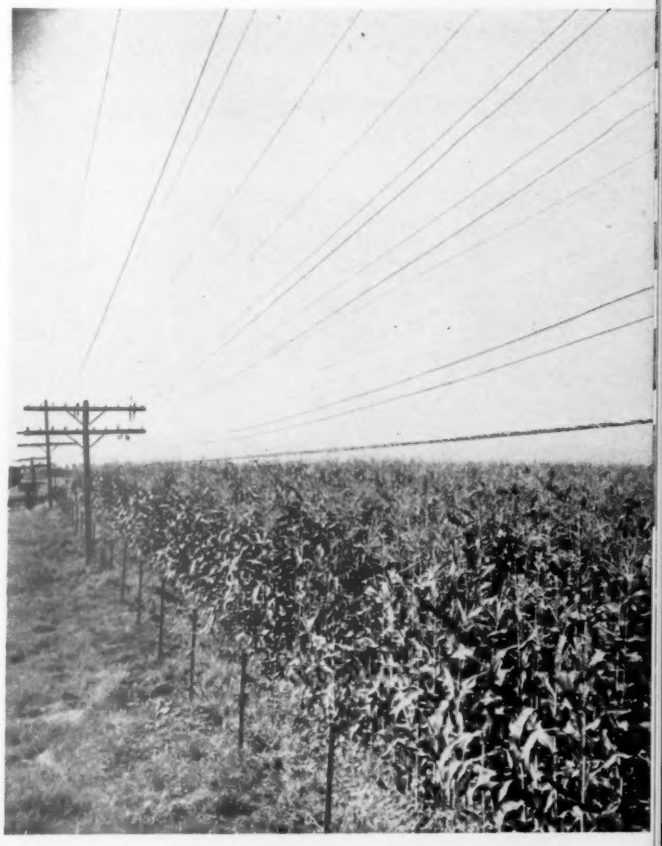
UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation,* 30 East 42nd Street, New York 17, N.Y.
In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario.
The terms BAKELITE and UNION CARBIDE are registered trade-marks of UCC.



PENNSYLVANIA – Polyethylene has stood up under exhaustive indoor and outdoor tests carried out in western Pennsylvania during the past year. It has effected such savings in installation costs that it will be a major item in purchases for the coming year.

With respect to service life and safety, polyethylene is considered an outstanding improvement over other materials. It has shown unusual resistance to weather and abrasion. Its extremely light weight permits a smaller cable construction that is easier to handle, making for faster installations. It also permits wider pole spans, with a consequent saving in poles and maintenance.



ILLINOIS – Cable with polyethylene insulation and vinyl plastic jacketing has been used in Central Illinois since 1953. Its light weight has resulted in a 5-ft. reduction in pole height, elimination of guy wires and messengers, faster handling of cable, and wider spacing of poles.

Excellent results are reported with spans of 400 feet, compared to the 240-ft. spans needed with conventional cable. The light weight and high strength of the cable assembly are particularly important in winter, lessening the damage from ice and sleet loading. Because of its high dielectric strength, polyethylene now replaces fabric on circuit wiring.

two point Glidden pattern

four point Glidden pattern

FULLY AUTOMATIC BARBED WIRE MACHINE

for the manufacture of all commercially used types of barbed wire

two point Jowa pattern

four point Jowa pattern

three-wire four point Jowa pattern

Waukegan pattern

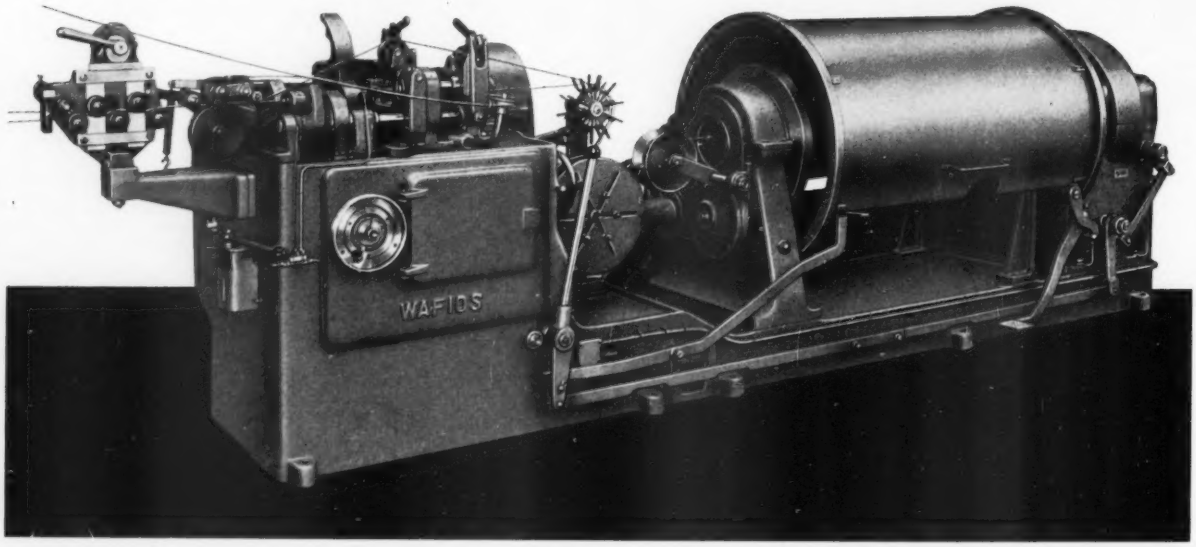
two point Domingo pattern

Simplex pattern

four point Domingo pattern

Perfect pattern

The machine is fully automatic and performs all the operations necessary in the production of barbed wire from the wire intake to the finished wound coil. It even stops automatically when the desired length of wire is reached.



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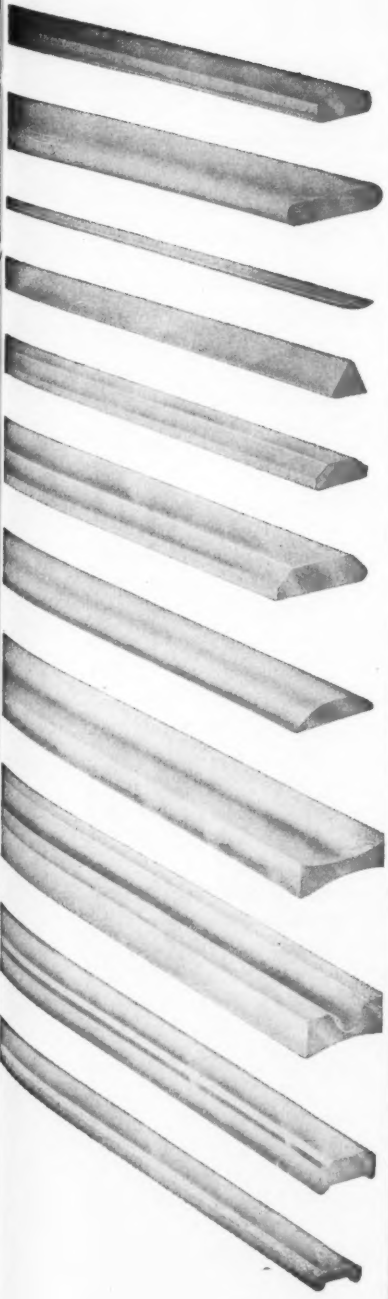

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in Coils or Straight Lengths

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Shaped Wire in Coils or Straight Lengths, Ferrous or Non-Ferrous.

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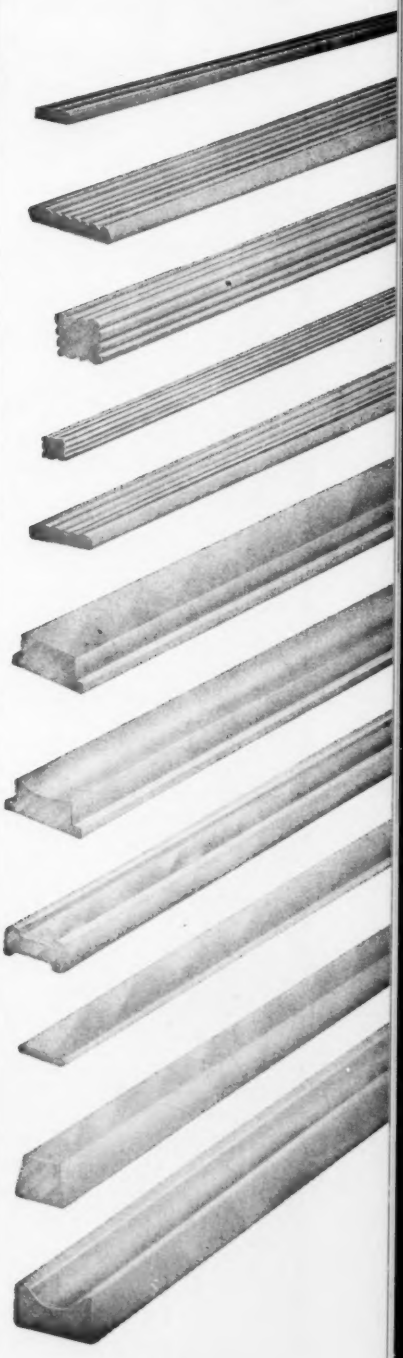


Manufactured by

THE NATIONAL LOCK WASHER COMPANY

PRECISION SHAPED WIRE DIVISION

NEWARK 5, N. J. MILWAUKEE 2, WIS. U.S.A.

U.S.I.

Vol. II, No. 6

POLYETHYLENE PROCESSING TIPS

RESIN PROPERTIES THAT AFFECT STRESS-CRACK RESISTANCE OF POLYETHYLENE

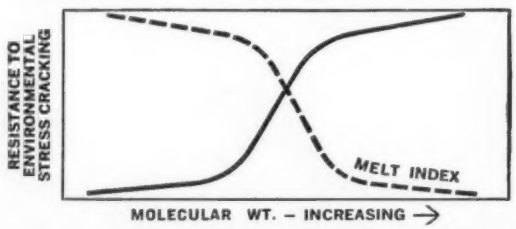
Environmental stress cracking is the term used to describe a certain type of material failure. With polyethylene this failure occurs when the plastic is under high local stress (either external or internal) and in contact with materials such as a soap, detergent, or solvent, which affects the polymer.

Resistance to stress cracking is especially important for applications such as electrical insulation, polyethylene pipe, housewares, and certain types of packages.

Two factors influence the resistance of a polyethylene part to environmental stress cracking: the resin used and the conditions used in fabricating the part.

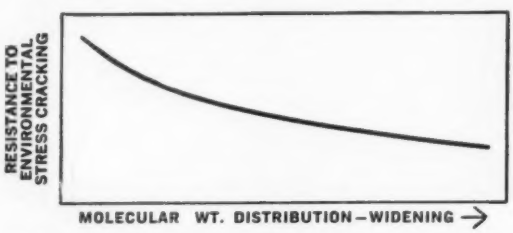
Which resin to use:

Stress crack resistance is greater with a resin of ***higher molecular weight*** – that is, lower melt index.



Then why not use low melt index resins? Because production rates are lower. The processor must make a compromise between peak production rate and top stress-crack resistance and use a resin that will be satisfactory, if not ideal, in both respects.

Molecular weight distribution of the polyethylene



resin is important too. Resins with a narrow molecular weight distribution (with fewer molecules much higher or lower than the average) have better stress crack resistance than those with wide molecular weight distribution (more of the larger and smaller molecules but the same average). The low molecular weight fraction is more susceptible to attack by environmental materials.

However, the flow properties of a polyethylene resin having a narrow molecular weight distribution and a given melt index are not as good as those of a polyethylene resin having a wide molecular weight distribution and the same melt index. Here again the processor must make a compromise between production rate and the properties he requires in the end product.

Density of the resin will also have an effect on the resistance of that polyethylene resin to environmental stress cracking. The higher the density, the poorer resistance to environmental stress cracking. On the other hand, the more linear or more dense polyethylenes have enhanced flow properties and higher stiffness and tensile strength.

There is no single answer to all problems

It is obvious from the preceding discussion that there is no simple solution to the selection of a resin for a particular end use. The resin must be carefully selected while giving proper consideration to the important end properties required in the fabricated article.

An answer to your particular problem can be found by obtaining a polyethylene resin from a manufacturer who can give you the balance of properties required – high or low melt index, narrow or wide molecular weight distribution, a range of densities. U.S.I. is one such supplier and their Technical Service Representatives stand ready to assist you in the selection of the proper Petrothene resin.

Processing conditions affect stress crack resistance

Processing temperatures, cooling rates, and other processing conditions can have a marked effect on stress crack resistance, because of residual strains left in the fabricated article.

There isn't room to go into these in detail here but the next issue of "Tips" will discuss them more fully.

Meanwhile if you have a specific problem, call on U.S.I.'s Technical Service Engineers. They will be glad to work with you toward finding a solution.

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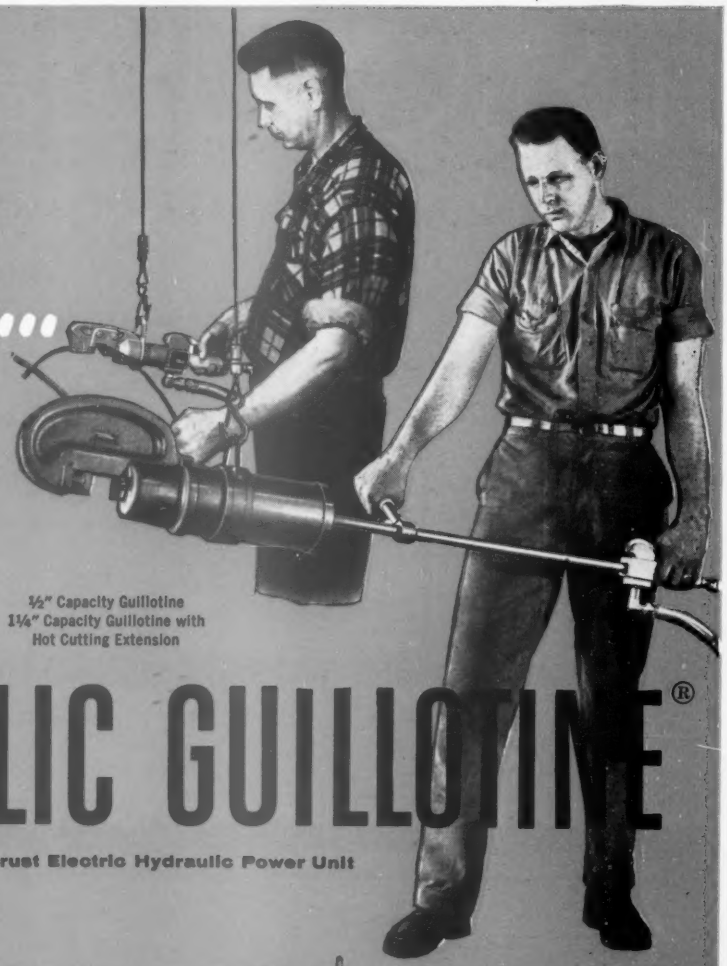

½" Capacity Guillotine
1¼" Capacity Guillotine with Hot Cutting Extension

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Powered by Manco Hi-Thrust Electric Hydraulic Power Unit

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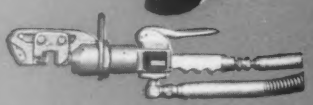
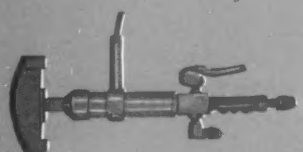


Model MC 210: Capacity ½". High speed . . . ¼ second per cut. Full swivel action.

Model MC 35: Capacity 1". Cuts high carbon material including reinforcing rod in only one second per cut.

Model MC 65: Capacity 1¼". Cuts 1¼" diameter steel in 2 seconds per cut. Can be modified to cut 1⅝" diameter aluminum.



MANCO HYDRAULIC ROD STRAIGHTENER

Ideal for straightening leading end of heavy coiled wire for insertion into drawing dies and cold heading machines. Capacity of 3/16" to 1¼" diameter steel rod.

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Please send:
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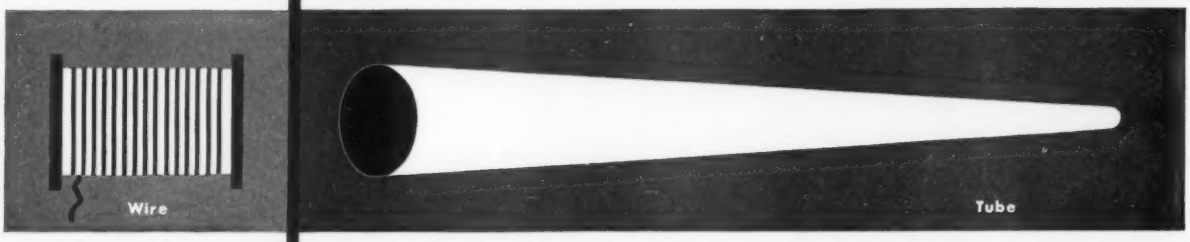
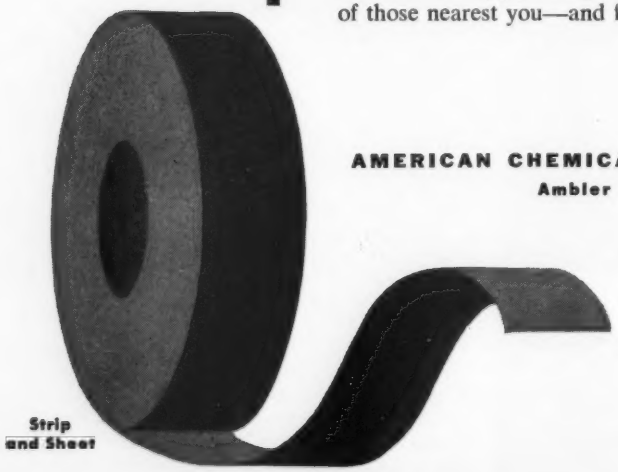
SPECIFY STAINLESS STEEL STOCK COATED WITH NEW GRANODRAW SS®

—chemical conversion coating aids cold mechanical deformation, protects against surface pitting in storage.



For the first time you can safely specify precoated stainless steel tube, wire, strip and sheet from your mill source—and avoid a costly installation of process equipment in your plant. The chemical conversion coating formed in the new Granodraw SS process facilitates drawing, stamping, cold heading, and cold forming operations, even after the stock has been stored. It also protects the stock against pitting in transit and storage.

Mills can supply this precoating service. Call on us for the names of those nearest you—and for complete information.



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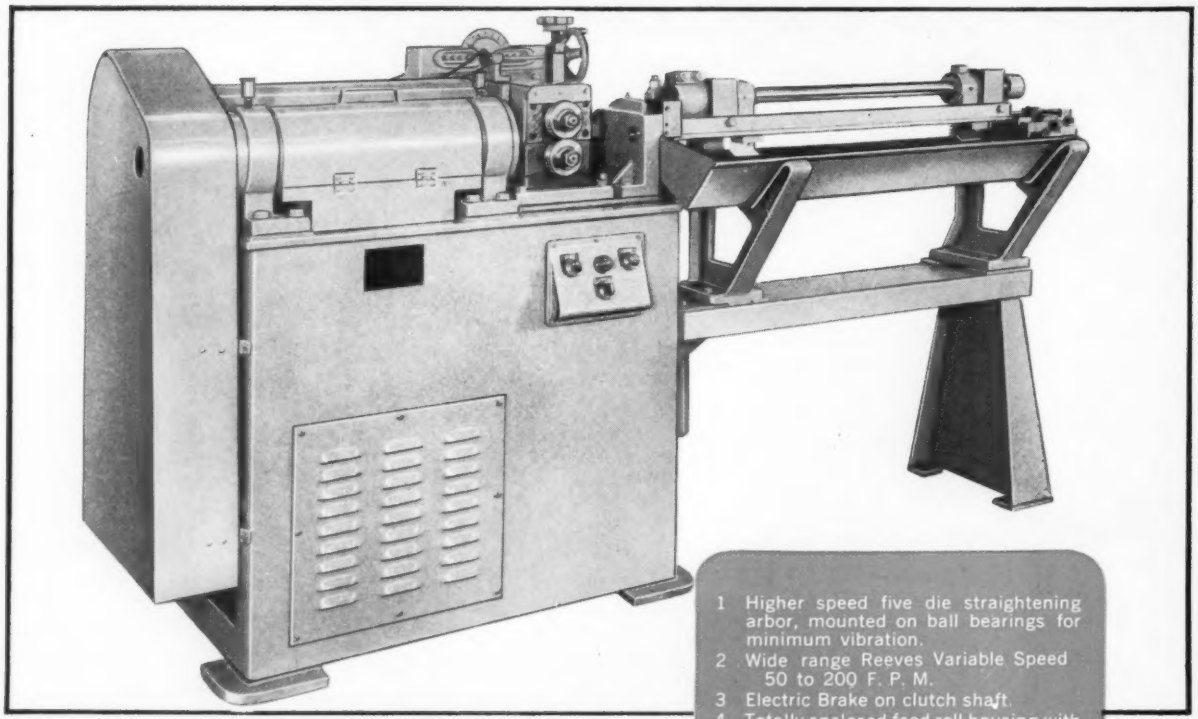
ALL NEW SHUSTER 2AV

variable speed – electrically controlled Wire Straightening and Cutting Machines

9 WAYS BETTER



1. Higher speed five die straightening arbor, mounted on ball bearings for minimum vibration.
2. Wide range Reeves Variable Speed 50 to 200 F. P. M.
3. Electric Brake on clutch shaft.
4. Totally enclosed feed roll housing with shafts mounted on Timken Bearings. Gears in oil.
5. Machine totally enclosed with guards.
6. Electric control Panel – one position operation.
7. Electric trip mechanism on target.
8. Solenoid-operated roll-type clutch.
9. Wire size range:
   1/16" to 5/16" mild steel wire.
   1/16" to 3/16" high tensile wire.

The BEST is *STANDARD* with SHUSTER!

THE SHUSTER 2AV wire straightening and cutting machine (illustrated) includes 9 features as STANDARD EQUIPMENT. These features are your key to fast, accurate and economical production . . . they are furnished as STANDARD equipment on 18 of the 23 models manufactured by Mettler.

In addition, the new 2AV automatically cuts lengths up to 14" at the rate of 140 pieces per minute, without use of clutch, when selector switch on new control panel is set on "Hand" position. The 2AV also provides *infinite* variable speed within all feed and cutoff ranges.

All rotary-type SHUSTERS may be supplied with interchangeable 12-roll, central foot straightening accessories for shape stock.

Send for free, wall-size split gauge Wire Chart from 41 gauge to 7/0.

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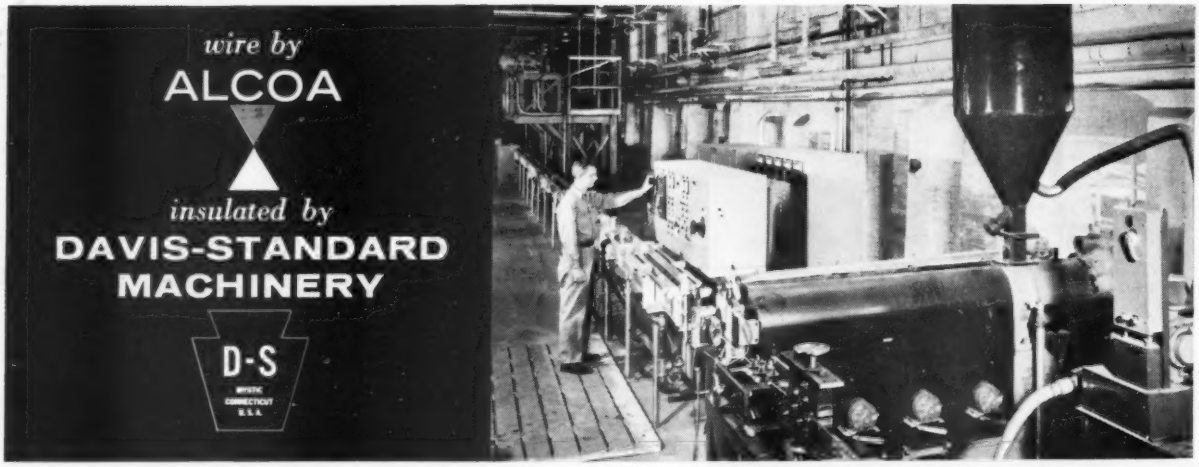
QUALITY WIRE DESERVES QUALITY INSULATION



View of installation of D-S 4½" Extruder and controls at the Massena, N. Y., plant of The Aluminum Co. of America.

At ALCOA'S Massena plant, D-S equipment insulates primary and secondary distribution and service drop wire. To date, the Davis-Standard Extruding, Pay-Off, Take-Up and Capstan machinery has a highly satisfactory performance record with negligible shutdown time. ALCOA is especially pleased with the diameter control, an essential factor in quality control.

From Pay-Off to Take-Up, Davis-Standard is the foremost name in wire insulating machinery. The advanced design, exacting workmanship and high-grade materials of D-S extrusion machinery cut downtime and reduce maintenance to a minimum.

D-S exclusive THERMA-FIN temperature control provides more precise diameter control. The outstanding advantages of D-S extrusion machinery reflect a great savings in costs, such as rejects and spark test failures.

Leaders in the wire industry rely on Davis-Standard for quality extrusion machinery.

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- Uniform coils — for trouble free pay-off.
- Size and shape — available in most sizes and shapes — round, square, flat and half-round.

Your "Wire Forms" can be fabricated easier and better at high speed production with low or no scrap loss by using "United" round or shaped wire.

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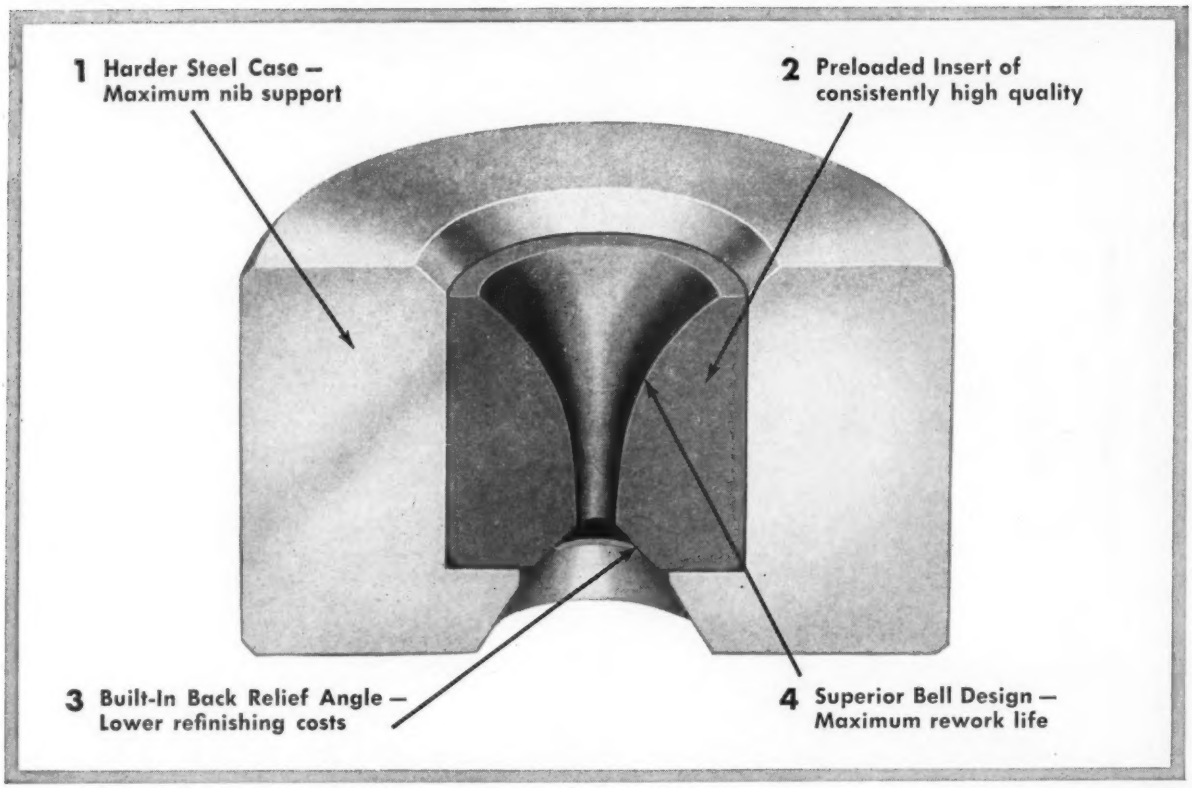
ALUMINUM, BRASS, COPPER WIRE AND TUBE - BRAZING ALLOYS AND FLUXES


1 Harder Steel Case — Maximum nib support
2 Preloaded Insert of consistently high quality
3 Built-In Back Relief Angle — Lower refinishing costs
4 Superior Bell Design — Maximum rework life

Better design, new manufacturing process . . .

WHY CARBOLOY® DIES WEAR LONGER ...YET COST YOU 20% LESS

Research is the answer! New low-cost Carboloy wire dies are the result of the Metallurgical Products Department's continuing research into die design and process improvement. Here's how this leadership pays off for you now:

Longer Service Life Through 4 Design Features

1 Stronger alloy steel case — provides maximum nib support; permits rapid heat dissipation.

2 Long-wearing carbide insert of consistently high quality; nib is preloaded for extra support.

3 Built-in back relief angle — reduces refinishing costs. Can be reworked as many as 10 to 15 times.

4 Bell angle holds original size after reworking; bell contour designed for proper lubrication, maximum life.

20% Price Reduction Through Mechanization

All Carboloy wire dies are now made on a new, mechanized production line. Result: you get high-quality dies with all the features listed above — at savings of approximately 20%.

And you get *more!* "Bonus" services include: on-the-job engineering assistance; immediate local delivery; complete die-servicing facilities.

Whether you're flattening, drawing, extruding, or heading, there's a Carboloy cemented carbide die product to fit your needs. For more information, or in-plant technical assistance, write: Metallurgical Products Department of General Electric Company, 11171 E. 8 Mile Street, Detroit 32, Michigan.

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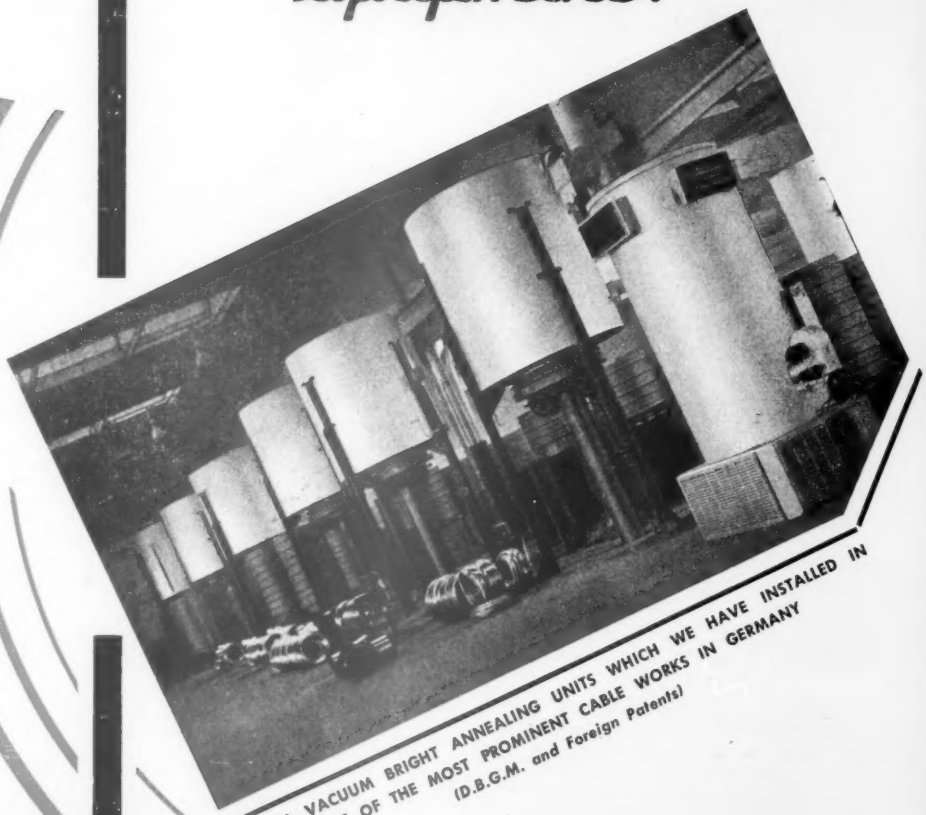
CEMENTED CARBIDES

GENERAL ELECTRIC

This is modern German equipment!



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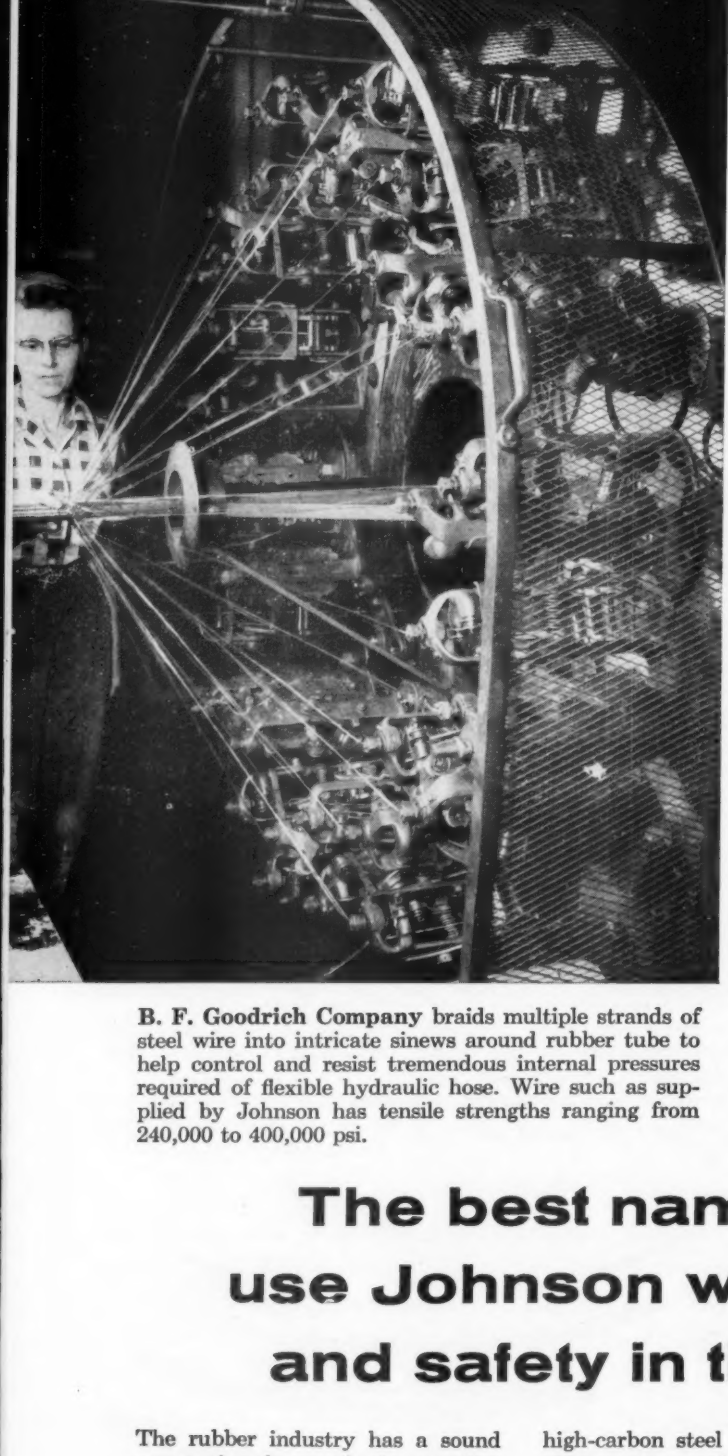


B. F. Goodrich Company braids multiple strands of steel wire into intricate sinews around rubber tube to help control and resist tremendous internal pressures required of flexible hydraulic hose. Wire such as supplied by Johnson has tensile strengths ranging from 240,000 to 400,000 psi.

Firestone Tire and Rubber Company uses only high tensile steel wire of exacting tolerances in building tire beads. Rapidly entering the bead machine in parallel —three to fifteen wires wide, depending on strength specified—the wires are coated with rubber. Clean bronze finish on Johnson wire assures proper rubber adhesion.

The best names in rubber use Johnson wire for strength and safety in tires and hose

The rubber industry has a sound reputation for producing quality products in advance of its needs by use of imaginative research—painstaking development of production methods—careful selection and testing of component materials.

Goodyear—Firestone—U.S. Rubber—B. F. Goodrich—Thermoid and others have established their names over the years by giving the general public and industry alike—strength, safety and durability in products such as long lasting pneumatic tires and tough pressure hose.

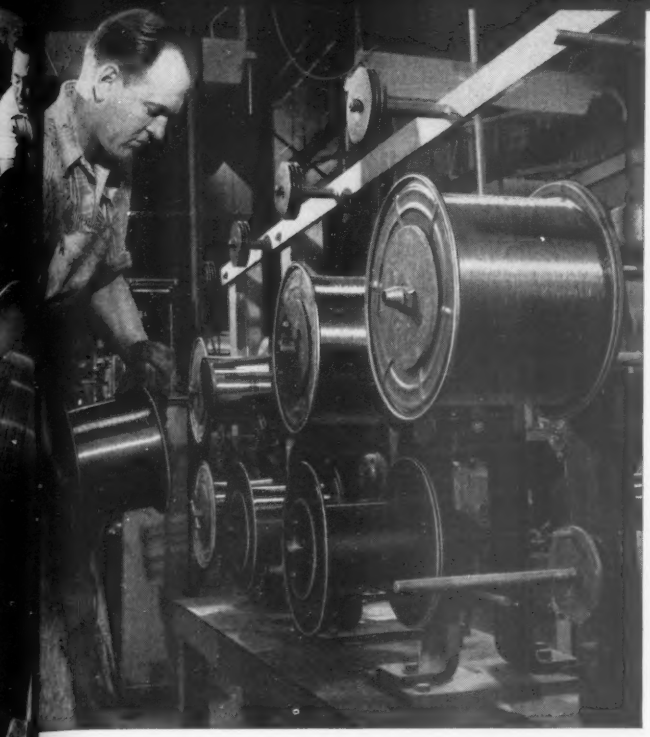
These two products owe their strength in part to the fine steel wires hidden inside them. For it is high-carbon steel bead wire which gives a pneumatic rubber tire—no matter what its size or job, the strength demanded by modern vehicles. Similar wire gives pressure hose its strong sinews which enable it to withstand working pressures as high as 10,000 psi—bursting strength may be three to four times as great.

Take the case of tire bead wire which Johnson supplies to every major tire manufacturer in the country. It is precision-drawn from special high-carbon rods to .037″ in diameter with a tolerance of only .002″—so fine that a 750-pound reel contains 39 miles of wire. Yet, a single strand exceeds 290 pounds of breaking strength equal to a tensile strength of 270,000 psi.

Also the wire must present a clean, unbroken surface and have a good and uniform bronze finish. This finish makes possible tight adhesion between the wire and the rubber surrounding it.

All these qualities contribute to the tire bead strength, help assure the safety of those who ride for work or pleasure on pneumatic tires.

Another special wire made by Johnson for the rubber industry helps rubber hose contain enormous pressures demanded by modern industrial applications. This reinforcing wire is drawn from selected high-



Thermoid Western Division of Thermoid Company has cut wire rewind loss to ½ of 1% by use of Johnson Discard-a-Spool which eliminates overlaps and tangles, protects wire quality in shipment. The one-way disposable spool weighs only 28 ounces vs 200 ounces for standard spool—slashes tare weight 14 times.

United States Rubber Company wires tires for strength on this bead building machine. The strength comes from the steel wire bead in the edge of each tire. Johnson makes special high-carbon steel wire—.037″ in diameter with tolerance of only .002″ for U.S. and other major tire companies.

carbon steel in diameters ranging from .008″ to .020″ and has exceptional dimensional accuracy—tolerance is plus or minus .0005″.

Johnson hose reinforcement wire is supplied with a special liquor finish to provide maximum adhesion of steel to the rubber which fills the interstices between braids.

The wire is uniformly cast to make possible even spooling and has uniform tensile strength to prevent breaking under the working tension.

These excellent wire qualities, plus careful packaging and prompt delivery, have resulted in Johnson becoming a prime supplier to the rubber industry for hose reinforcement wire.

The outstanding performance of Johnson wire in the rubber industry is typical of the experience in other industries where Johnson supplies aircraft cord wire, armature binding wire, wire for brushes, metal stitching, preformed staple wire, bobby pin wire, rope wire, oil tempered and MB hard drawn spring wire, and music spring wire in a wide variety of sizes and finishes.

If you use specialty wires, call one of the offices listed to right and explore the advantages of Johnson quality which combines strength with economy.

The Goodyear Tire & Rubber Company finds that Johnson meets their exacting requirements for tire bead wire which has high tensile strength, twisting strength, elongation and special surface finish. Here parallel tire bead wires uncoil evenly into a bead building machine.

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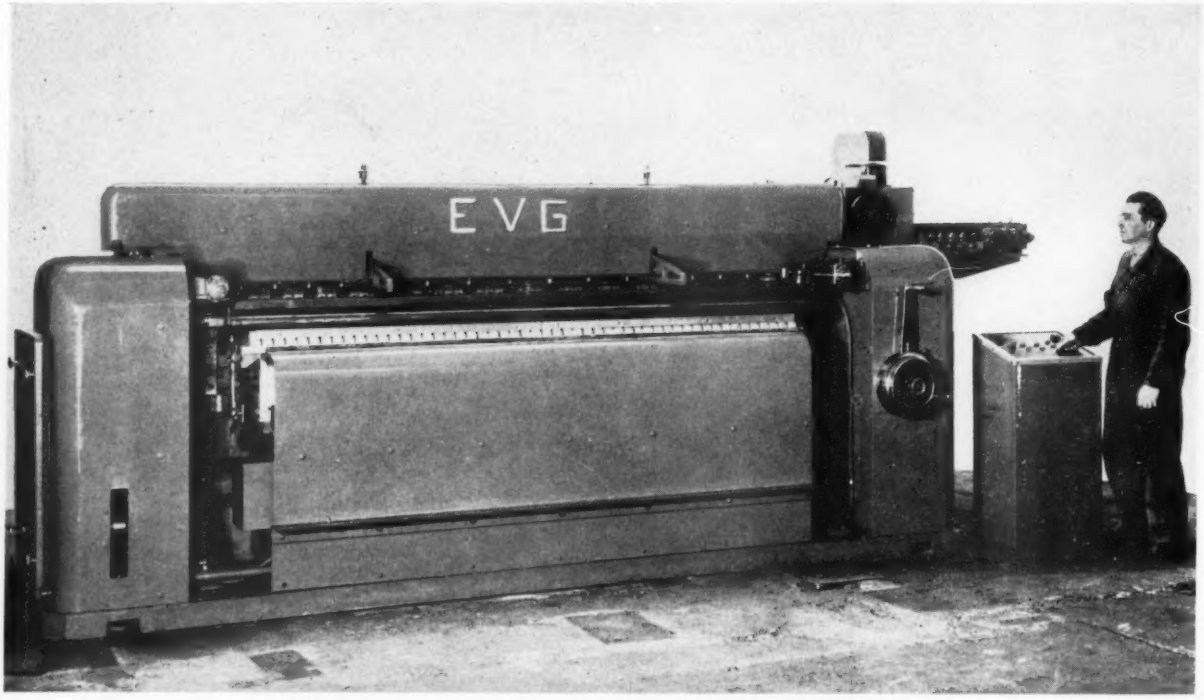
Designs and builds wire fabric welding plants—complete from pay-off to finished product.

Installations throughout the world.



Shown in photograph: Model G5—gauge range 4/0 (other models up to 7/0)

Check these features of a typical EVG reinforcing mesh plant:

- **WELDER UNIT:**
  1. Latest type automatic feeding, straightening and cutting devices.
  2. Sensitive adjustments for pressure, heat and dwell.
  3. Full electronic controls.
  4. *Quick change-over* for spacing and gauge.
- **CUT-OFF SHEAR:**
  Self-indexing, hydraulic type of special EVG design. Good visibility.
- **SHEET HANDLING:**
  The ultimate in automation. Motor driven flip-over turns alternate sheets for close nesting; self-engaging and self-releasing overhead trolley transports sheets and stacks on pile.
- **ROLL HANDLING:**
  Fully automatic self-stripping roll take-up. Variable speeds permit continuous operation of welder.

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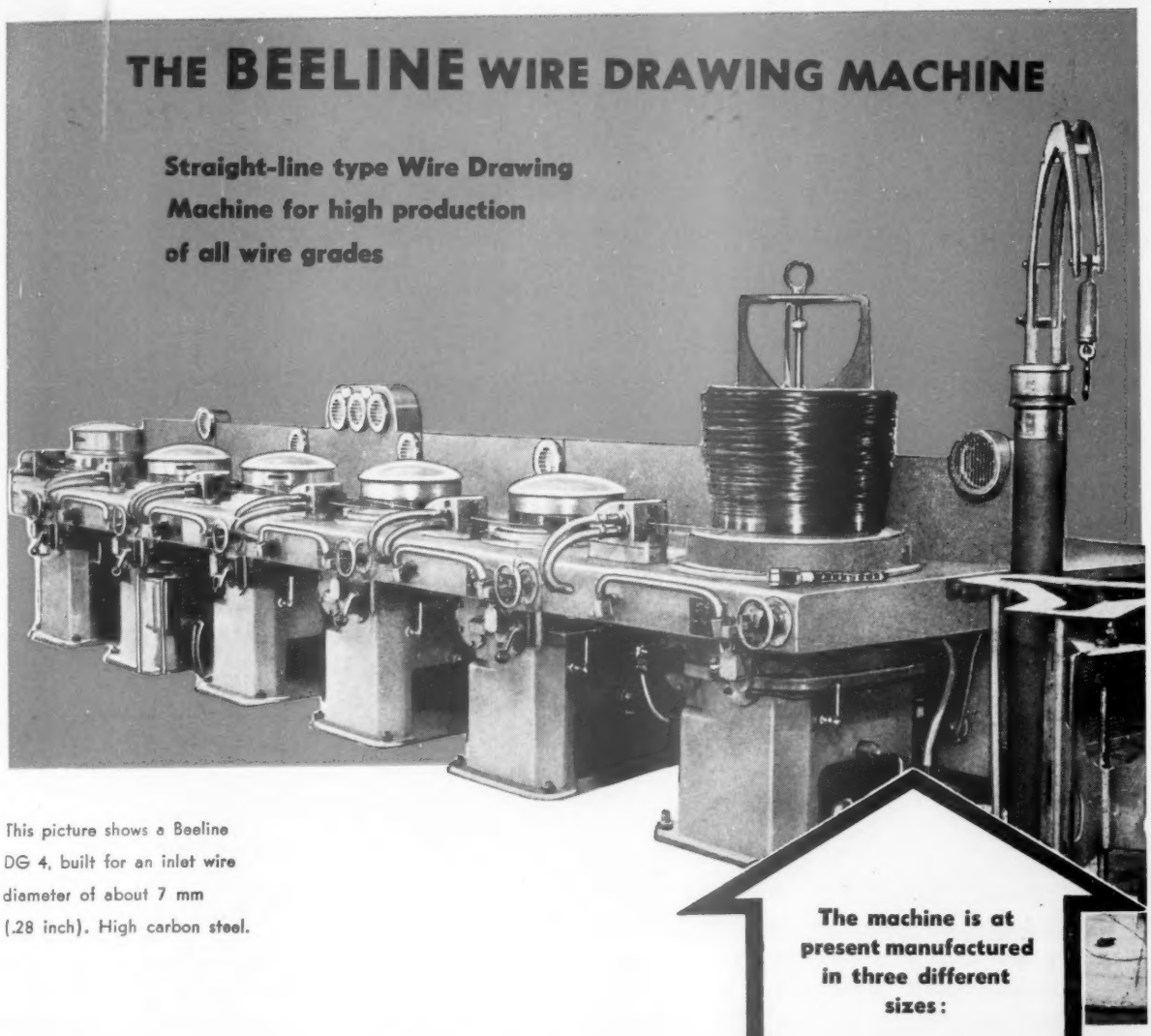
THE BEELINE WIRE DRAWING MACHINE

Straight-line type Wire Drawing Machine for high production of all wire grades



This picture shows a Beeline DG 4, built for an inlet wire diameter of about 7 mm (.28 inch). High carbon steel.

Prominent Beeline features:

- Complete absence of slipping between wire and block.
- Direct block-to-block wire running, with automatic speed control and no loops or other mechanical adjusting devices.
- Continuous speed adjustment from almost zero up to maximum.

Let us help you solve your problems. We shall be glad to answer your questions promptly. Don't forget to let us know what wire is to be drawn, the inlet and finished diameter, its intended use, the production required, and all other relevant information (tensile strength of the finished wire etc.). Then we can suggest a machine that is just right for you.

The machine is at present manufactured in three different sizes:

BEELINE DG 5
for heavy wire, about 13 mm. (.500 inch)

BEELINE DG 4
for wire rods, about 7 mm. (.28 inch)

BEELINE DM 3
for wire with an inlet diawire of about 3 mm. (.116 inch)

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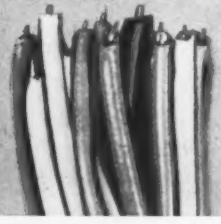
Cables: Morgårdshammar, Ludvika. Tele: 0240–71100

THE MESSAGE IS: MONSANTO

Sturdy OPALON 72285 over primary insulation for color-coded, weather-resistant jacketing. Polyethylene 14202 and 11302 for primary insulation of conductors and insulation for steel support wire in Multi-Pair Distribution Cable.



Polyethylene 12203 and 12253 for primary insulation, Polyethylene 14202 for jacketing in jacketed Thermoplastic-insulated, Thermoplastic-sheathed Telephone Cables.

OPALON 1706 for semi-rigid primary insulation in various types of communication cable.

Rugged weather-resistant color-coded OPALON 72285, available in eight standard colors, for primary insulation and Polyethylene insulation for steel support wire on Urban Distribution Cable.

OPALON 1006 for primary insulation, OPALON 72217 for jacketing in Inside Telephone Wiring Cable.

your finest single-source for ***polyethylene and vinyl*** *telephone insulating compounds*

Wire and cable producers like the multiple choice that Monsanto supply offers—9 formulations, polyethylene or Opalon vinyl, all specially developed for critical communications applications.

Here, from one great single-source, are the insulating compounds combining the many different mechanical and electrical properties you need . . . insulating efficiency, extrusion characteristics, surface finish, weatherability, colorability.

Call in your local Monsanto representative for the full communications story, or write for technical data and other information to Monsanto Chemical Company, Plastics Division, Room 2014, Springfield 2, Massachusetts. OPALON: REG. U. S. PAT. OFF.

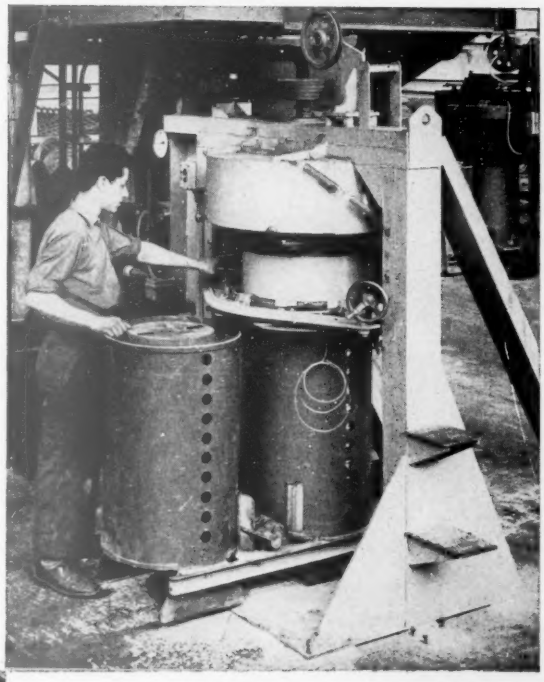
MONSANTO

4.800
feet per minute

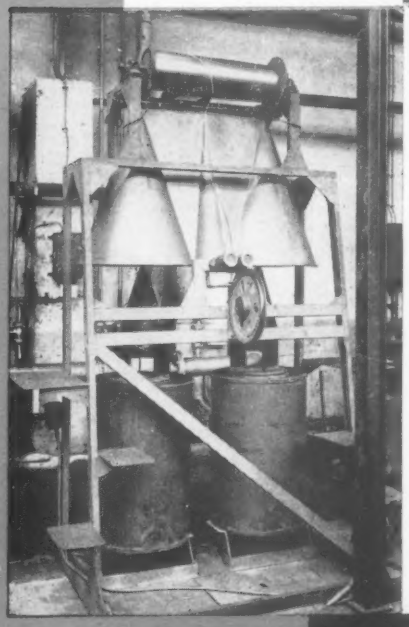
is the speed never reached before of the new continuous

Godderidge

Packaging Unit



Take-up device on a wire-drawing machine.



Double high-speed Pay-Off Stand

OUTSTANDING FEATURES :

- Range of diameter: from 8 to 24 B & S
- Changing of drums at full speed
- Diameter control possible whilst running
- Both-ends of wire accessible, therefore welding and continuous supply of high speed extruders possible by new double

PAY-OFF STAND

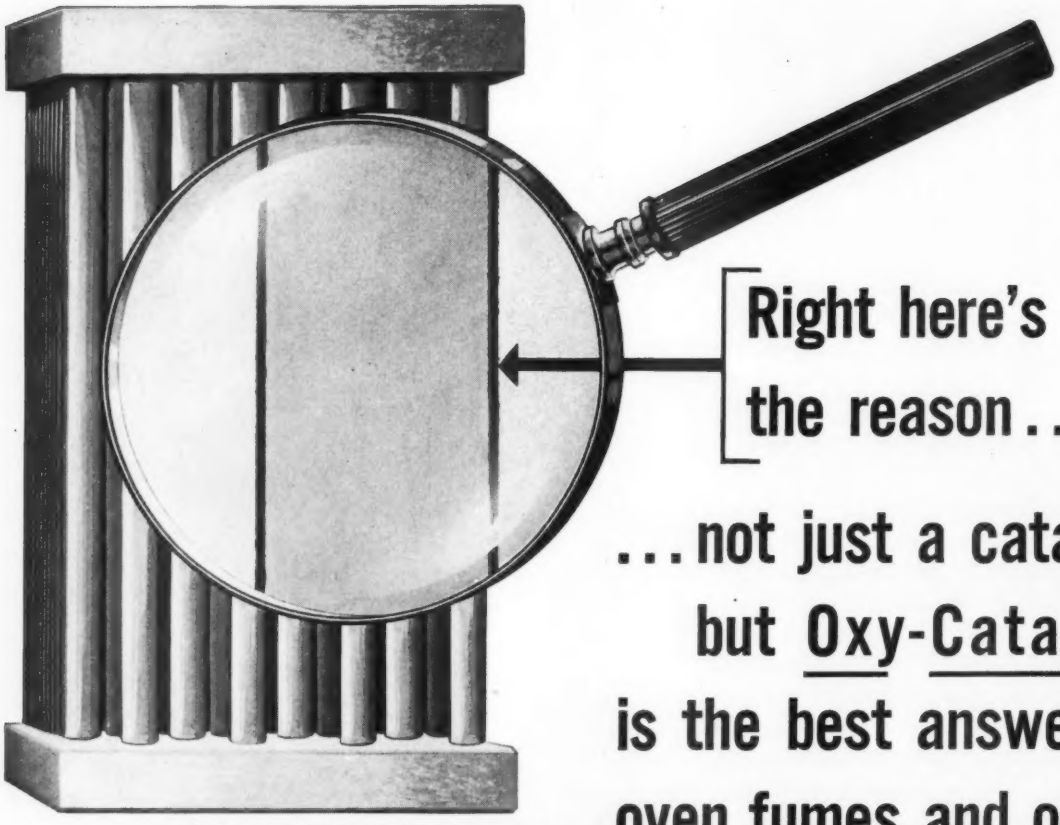
For further details write to

Godderidge

11, avenue Henri Barbusse HOUILLES (Seine-et-Oise)

FRANCE

JEAN MARQUENE



Enlarged cross-section drawing of an individual rod in an Oxycat unit

Right here's the reason...

...not just a catalyst but Oxy-Catalyst is the best answer to oven fumes and odors

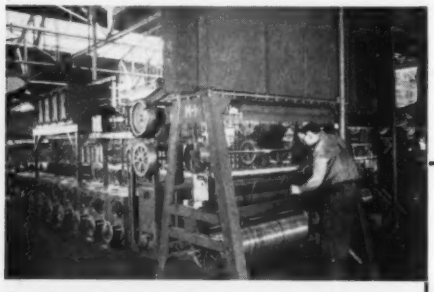
The secret lies in the .003-in. film on the porcelain Oxycat carriers. It's this more efficient catalyst which Oxy-Catalyst uses, a patented combination of alumina and platinum on porcelain, that gives better cleanup, better heat recovery, and longer catalyst life.

Oxycats can eliminate fumes and odors from drying ovens and other processes by oxidizing organic and combustible contaminants in the exhaust far more efficiently than any other catalyst ever developed.

To stop your oven fumes and odors—to recover waste heat—to reduce fire hazards and maintenance problems caused by troublesome condensates, Oxy-Catalyst offers a complete engineering service. We make the entire installation—engineered to your exact requirements—and we assume full responsibility for its performance.

Oxy-Catalyst works closely with all leading oven manufacturers. And new ovens can be designed with the catalyst as an integral part of the oven's heating system. So when you order new ovens, specify Oxy-Catalyst equipment.

If you would like to compare—to see for yourself the remarkably high efficiency of an Oxy-Catalyst installation—fill in this coupon, or write on your business letterhead, for complete information now.



Oxycat units were installed at the end of this vertical drying oven to oxidize troublesome solvent and varnish fumes at John A. Roebling's Sons Corporation, Electrical Wire Division Plant. This installation has been operating now for over 4 years.

OXYCAT

OXY-CATALYST, INC.

Industrial Division · Wayne, Pa., U.S.A.

Fume Elimination Processes and Equipment: Industrial • Automotive • Consumer Products

Oxy-Catalyst, Inc., Industrial Division, Wayne 12, Pa.

Please send me complete information on your catalytic installations:

☐ For fume and odor elimination ☐ For waste heat recovery ☐ Have your representative call

Name_____

Firm Name_____

Street_____

City_____ Zone No._____ State_____

NATIONAL

automatic welding unit

produces up to 231 sq. ft. wire mesh per minute

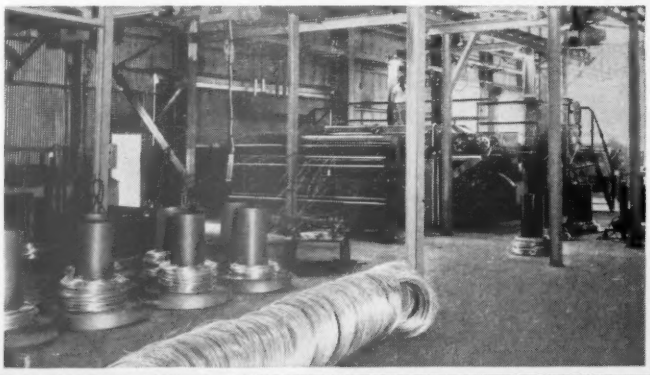
.....automatically

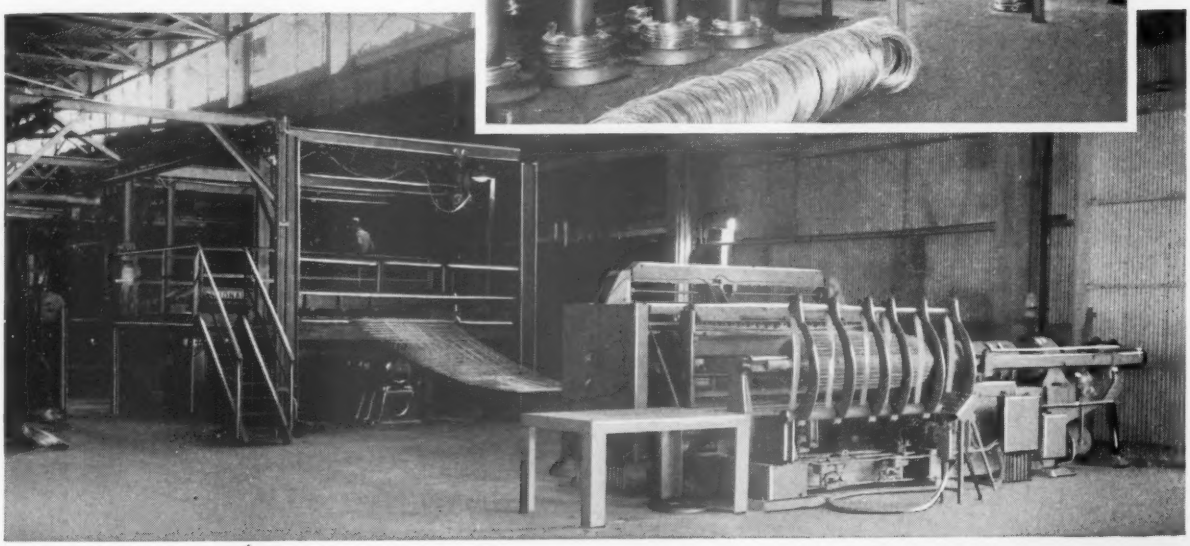
Developed specifically to produce wire mesh in a variety of sizes at high speed . . . this one National Electric Welding Unit drastically cuts manufacturing costs. All operations . . . wire straightening . . . feeding . . . welding . . . rolling . . . and cutting . . . takes place automatically with this one machine.

Highly versatile, this fabric welder produces mesh 8'-3" wide in all wire sizes from #10 gauge (.135 maximum) to #16 (.0625 minimum). The unit may be set up for longitudinal spacing from a one inch minimum to any desired maximum in one inch increments. Cross wire spacing is ½ inch minimum to 8 inch maximum in any desired dimension.

The unit consists of a longitudinal wire straightener and base assembly; dual automatic cross wire feeds; welding unit; mat puller and indexing unit; and cut-off stand and coiler. The cut-off stand incorporates a traveling carriage mounted motor-driven saw which travels across the mat during cutting.

The wire fabric, produced at such an amazing rate by this welder, is used for fencing, corn cribs, turkey pens, poultry yards, etc. But, no matter what type of volume welding job you do . . . it can be done quickly and economically with a National Electric Welding Machine designed to suit your individual application. Write for full information.





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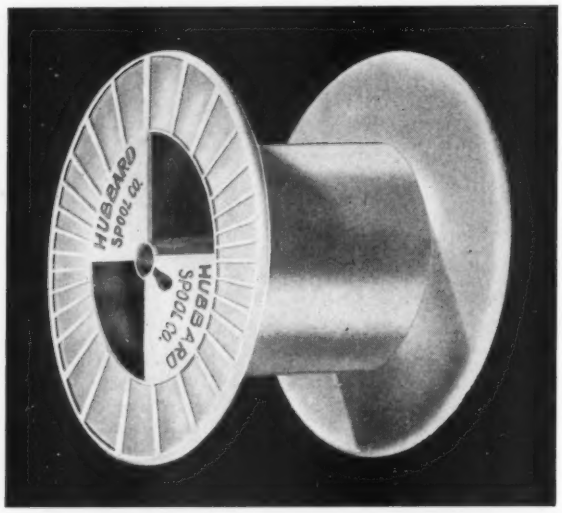
NATIONAL ELECTRIC WELDING MACHINES CO.

1880 N. TRUMBULL STREET • BAY CITY, MICHIGAN

25 YEARS EXPERIENCE DESIGNING AND BUILDING: SPECIAL & STANDARD • AIR • HYDRAULIC • MOTOR DRIVEN • SPOT • PROJECTION • SEAM • BUTT • FLASH • RESISTANCE WELDERS • PRODUCTION FIXTURES FOR ALL TYPES OF AUTOMATIC ARC WELDING

NEWLY DEVELOPED NON-RETURNABLE PLASTIC SHIPPING SPOOLS FOR MAGNET WIRE



DESIGNED FOR:

LIGHT WEIGHT • LOW FREIGHT COSTS • LOW INITIAL COST • HIGH STRENGTH WITH DIMENSIONAL ACCURACY AND RIGIDITY FOR SUPERIOR WINDING OF WIRE IN FINE GAUGES.

DESIGNED TO MEET YOUR CUSTOMER REQUIREMENTS FOR A NON-RETURNABLE—NO DEPOSIT CHARGE SPOOL FOR ALL TYPES OF WIRE!

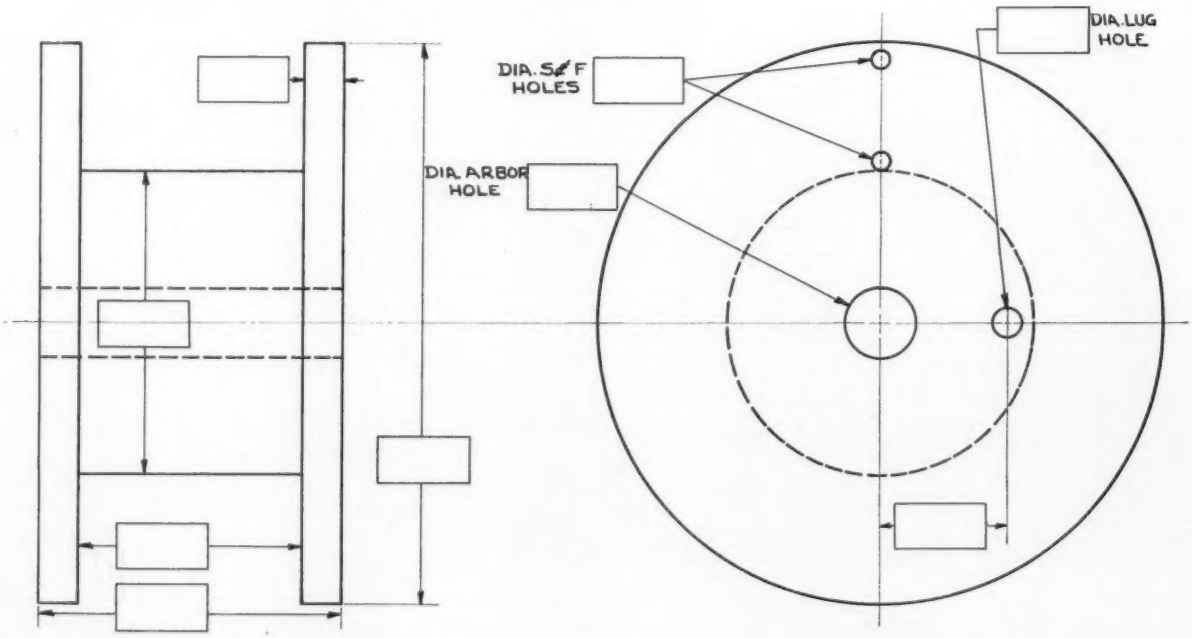
Fill out form below and SEND TO:

HUBBARD SPOOL COMPANY

GARRETT, INDIANA
Tel.: Garrett 840

MANUFACTURERS OF A COMPLETE LINE OF SPOOLS AND REELS — ALL CONSTRUCTIONS

TEAR HERE



ADDITIONAL REMARKS (TYPE OF MATERIAL, ETC.)

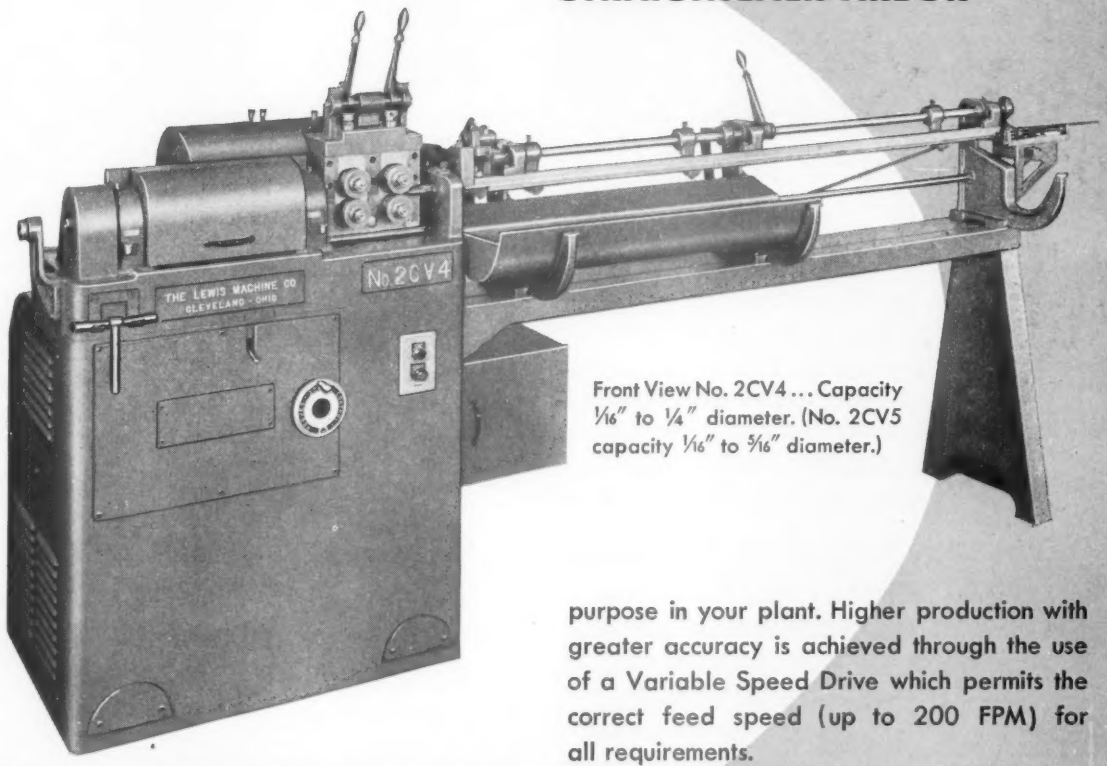
COMPANY NAME

REQUESTED BY

ADDRESS

THE NEW **LEWIS** *Convertible**

AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINES WITH VARIABLE SPEED DRIVE AND DUAL-CENTER STRAIGHTENER ARBOR



Front View No. 2CV4 ... Capacity 1/16" to 1/4" diameter. (No. 2CV5 capacity 1/16" to 5/16" diameter.)

* The new Lewis No. 2CV series is equipped with our Dual-Center Rotary Straightener Arbor and can be quickly converted to handle shapes by installing our interchangeable Roll Straightener.

This convertible feature introduces a new flexibility in wire straightening and cutting operations . . . one machine can serve a double purpose in your plant. Higher production with greater accuracy is achieved through the use of a Variable Speed Drive which permits the correct feed speed (up to 200 FPM) for all requirements.

The outstanding feature of this series is the DUAL-CENTER STRAIGHTENER ARBOR (Pat. Pending) for round wire. This feature increases the range of the machine and makes it possible to precision straighten small diameters below the capacity of other machines.

Other models available to handle .012" to 1" diameter, as well as shapes.

THE LEWIS MACHINE COMPANY

3441 East 76th Street • Cleveland 27, Ohio • A Division of Curtis Mfg. Co.

WIRE and WIRE PRODUCTS

reaches many prospects

YOUR SALESMEN DON'T KNOW!

No matter how big you are, the odds are you don't know all your actual prospective customers. Advertising in Wire and Wire Products will carry your sales story to them.

If your company is small, it is even more important to be "calling" on your prospects and customers regularly through advertising. It pays out handsomely.

Your advertising in Wire and Wire Products will be seen by many people in the plants you wish to "sell" whom your salesmen never would see, yet who specify, actually buy or who influence decisions on products to be purchased. Your advertising is bound to be of immeasurable value to you, too, in paving the way for a good reception for your salesmen when they do call. And the field's buying power is tremendous!

WIRE AND WIRE PRODUCTS circulation, is all paid. We have no agents, offer no premiums or make special inducements to get circulation, except the value of the editorial contents in itself—yet our renewals have averaged 97% or better for many years. That's why it is a good and forceful advertising medium for all concerns who have products to sell to the wire industry.

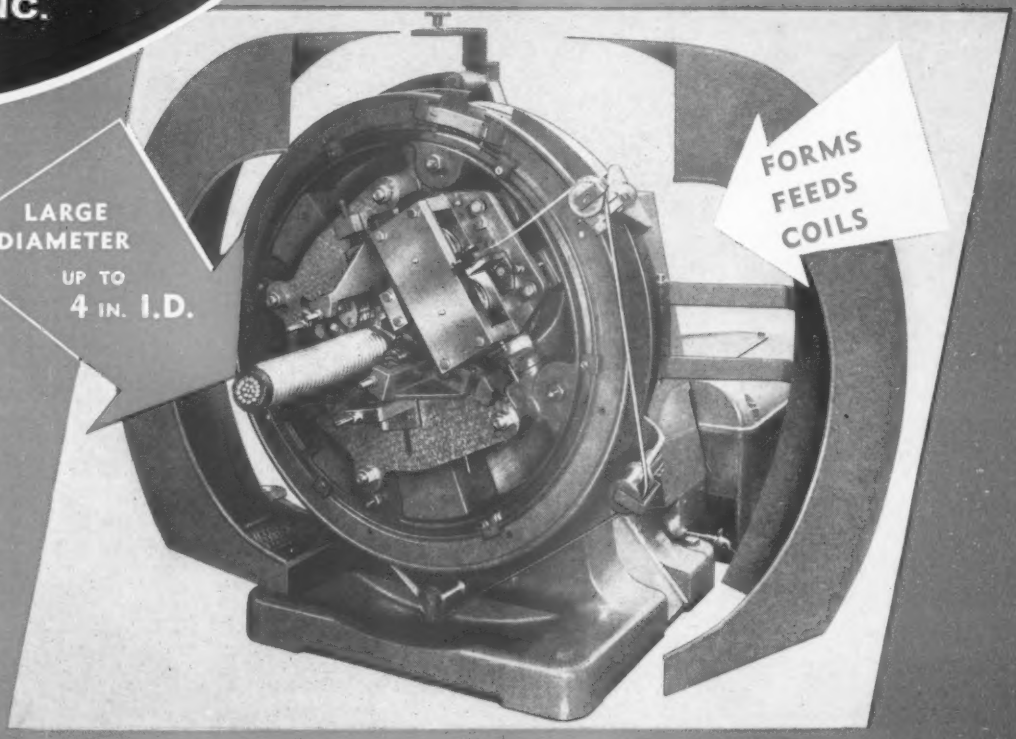
- **GET YOUR SHARE OF THE BUSINESS . . .**
- **ADVERTISE IN WIRE AND WIRE PRODUCTS . . .**
- **SEND FOR ADVERTISING RATES TODAY . . .**

WIRE and WIRE PRODUCTS

453 MAIN STREET **STAMFORD, CONN.**

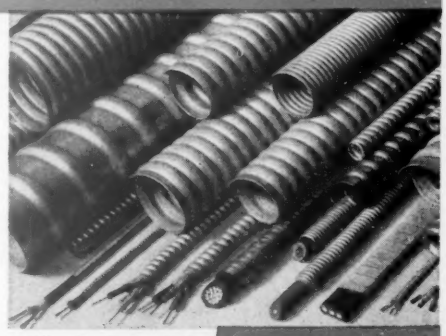
SLEEPER & HARTLEY INC.

4" CABLE ARMORING MACHINE Series A497



This top-quality S&H 4" cable armorer is the only machine of its kind that forms, feeds and coils in one operation. It is used extensively for armoring large diameter cables at a lower production cost.

This machine makes possible continuous production, since the armor does not rotate as it leaves the machine and an auxiliary strip spooler loads spare reels while the machine is in operation. It is another example of S&H's advanced engineering "know-how" that has made Sleeper & Hartley the leader in the field of automatic coiling machinery.



S&H builds a complete line of machines for armoring all sizes of cable up to 4" in diameter.

Other types of special Sleeper-built machines produce square-lock and interlock flexible tubing.

Write for latest information...

SLEEPER & HARTLEY INC.
BOX 1249, WORCESTER, MASS., U. S. A.

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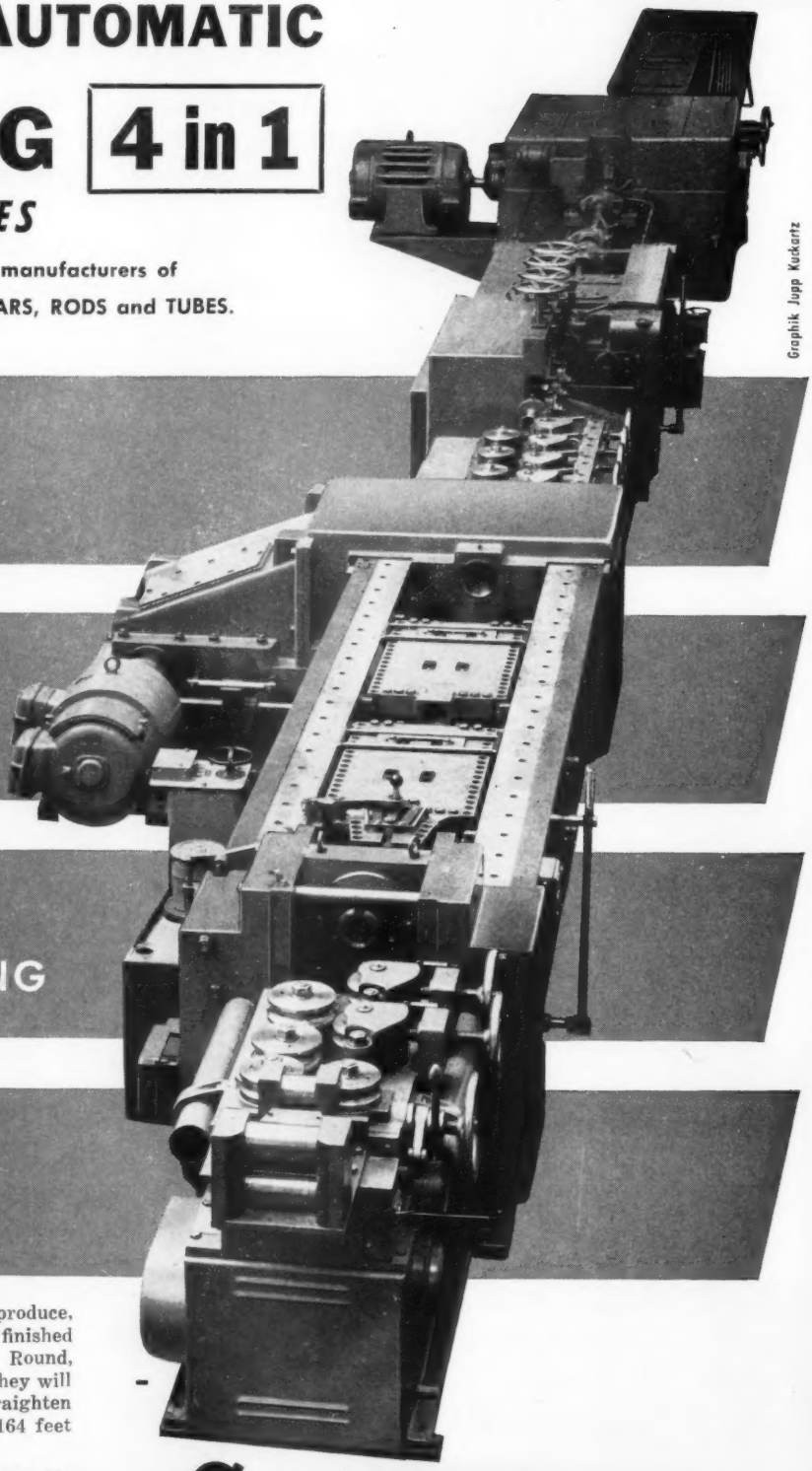
ORIGINAL MANUFACTURERS OF UNIVERSAL SPRING COILERS

THE FULLY AUTOMATIC

SCHUMAG 4 in 1

ASSURES

Greatest efficiency for manufacturers of
Ferrous and Non-Ferrous BARS, RODS and TUBES.



Graphik Jupp Kuckartz

4
POLISHING

3
CUTTING

2
STRAIGHTENING

1
DRAWING

- SCHUMAG "4 in 1" machines produce, **in one continuous operation,** finished Bars, Rods and Tubes from Round, Square or Hexagon material. They will Finish draw, Cut-to length, Straighten and Polish at speeds from 92-164 feet per minute.
- SCHUMAG "4 in 1" enjoys world-wide reputation as the **ultimate** in technical development.

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Exclusive Representatives for USA, Canada & Mexico
AMERICAN LAUBSCHER CORPORATION Fisk Bldg., 250 West 57th Street, New York 19, N. Y.

ALATHON® and ZYTEL®

POLYETHYLENE RESINS — NYLON RESIN

offer you these advantages for control cable construction

A thin primary insulation can be used for control cable construction because ALATHON 3C polyethylene resin has excellent electrical properties. Its low power factor and dielectric constant keep energy losses at a minimum. And ALATHON 3C is available in 11 colors for coding purposes.

Exceptional toughness is added by a skin of ZYTEL 33 nylon resin over the primary insulation. This is especially important at termination points, where rough handling and possible over-heating of cable are factors.

Resistance to abrasion, moisture and weathering is imparted by jacketing of ALATHON 4, BK-30. Remarkably tough and strong, it gives maximum protection and long service life, while maintaining a neat appearance.

The Du Pont family of ALATHON polyethylene resins has been established with particular insulating and jacketing applications in mind. Whatever your specific requirements, there is a proper ALATHON polyethylene resin for the job. If you would like more information, just mail the coupon below.

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REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept.
Room 4512, Du Pont Building, Wilmington 98, Delaware
Please send me more information on Du Pont ALATHON ☐ and ZYTEL ☐.

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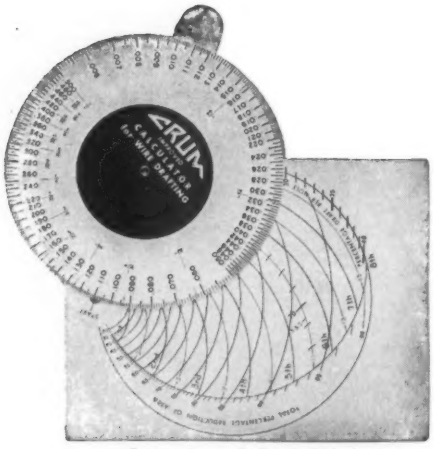
SAVE SET-UP TIME WITH THE . . .

CRUM CALCULATOR

FOR WIRE DRAFTING

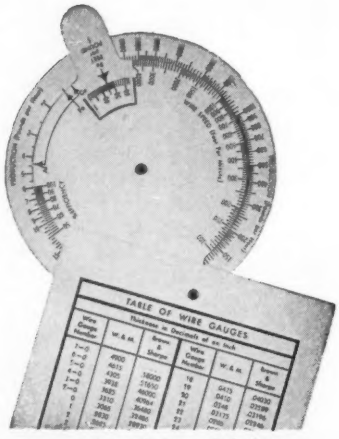
Useful and Accurate!



Front view of Crum Calculator.

THIS NEW DOUBLE-PURPOSE CALCULATOR WILL:

1. Provide quicker and more accurate information on die sizes and reduction areas;
2. Calculate wire production rates for various speeds and efficiencies.



Reverse view of Crum Calculator.

SOME OTHER FEATURES OF THE CALCULATOR

- Has new scale for more accurate determination of small percentages.
- Gives readings in B & S gauges.
- Intermediate lines provide reductions for 16 holes in one setting.
- New rectangular shaped back for better protection of calculator.
- More legible % draft-per-hole scale.
- Vinyl plastic construction, resistant to wear, warping, dirt, perspiration, wire drawing soaps—can be cleaned.
- Still fits your vest pocket.
- Handy tables of W & M and B & S gauges.
- Feet per pound calculating scale for steel, copper and aluminum wires.
- Durable, accurate, easy to use.

The improved Crum Calculator is worth its weight in gold in time saving —no laborious mathematical calculations necessary when you use it. Instruction sheet with examples accompany each Calculator. You should have one or more in your wire drawing department.

THE PRICE: $5.00 EACH

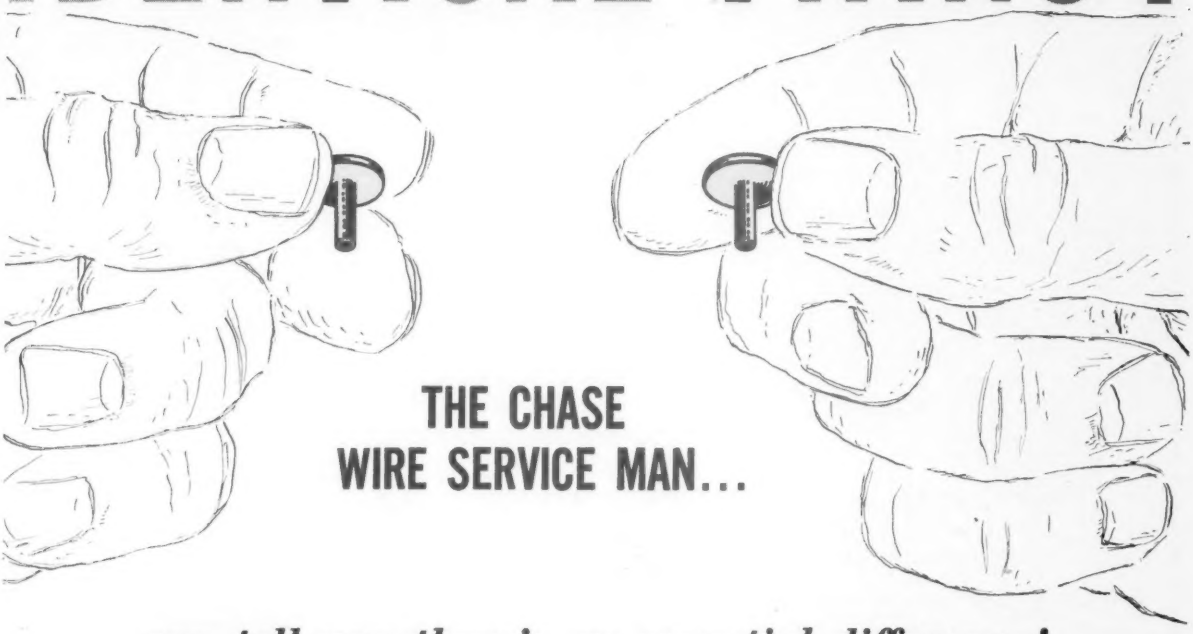
Send your orders to:

WIRE AND WIRE PRODUCTS

453 MAIN STREET **STAMFORD, CONN.**

(Exclusive distributors)

IDENTICAL TWINS?



THE CHASE WIRE SERVICE MAN...

can tell you there's an essential difference!

These "twin" rivets *look* the same, but the similarity ends there. Both are cold headed, but in one, the tubular section is formed by drilling the body of the rivet, and it's made from *stiffer* wire. The other has an extruded tubular section. For this operation, more *ductile* wire must be used.

Which is the right temper wire? That depends on various production factors. And that's where the CHASE WIRE SERVICE MAN can help *you!* Before ordering wire, tell us what you make and how you make it. Send sketches or samples. Let our experts guide your choice of size, temper and alloy. Chase will *product-engineer* wire to fit your individual needs!

This unique Chase Wire Service can help you step up production, save costs and make a superior product. So get in touch with the CHASE WIRE SERVICE MAN!

THE CHASE WIRE SERVICE MAN, W. F. Schmollinger, our Wire Mill Superintendent, heads our team of experts. For help in solving *your* fabricating problems, contact the Chase warehouse or office nearest you.

PRODUCT-ENGINEERED WIRE

Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT
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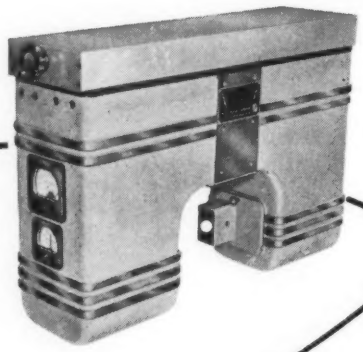
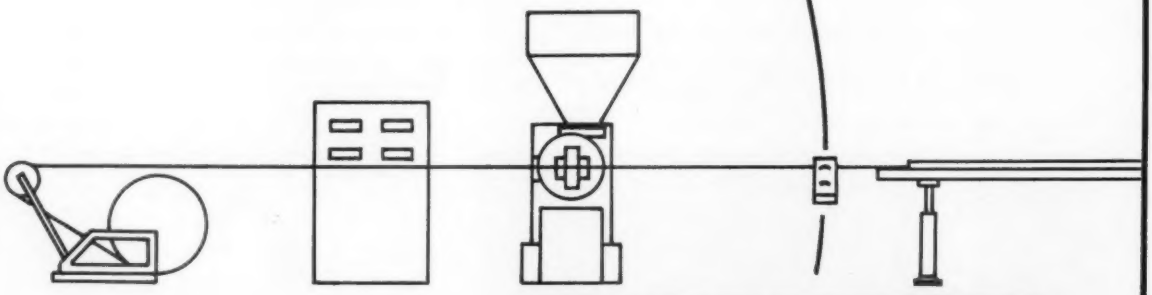
AUTOMATIC DIAMETER CONTROL

For Plastic Insulated Wire and Cable



with the
MICROLIMIT
CONTROL
CABLE GAUGE

Mounts Between Extruder and Water Trough
Continuous, Non-Contact Measurement
Automatic Control of Capstan Speed
Insensitive to Smoke and Fumes

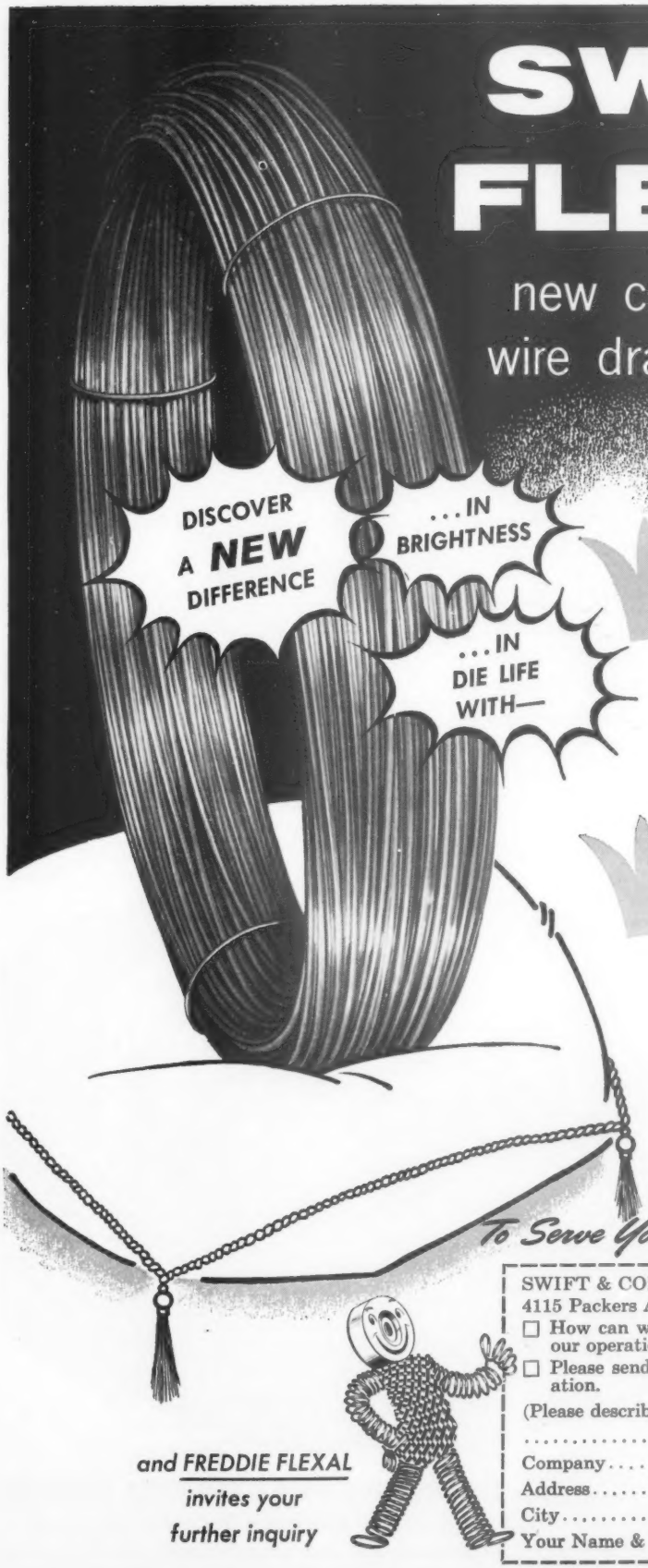


For further information—

INDUSTRIAL GAUGES CORPORATION • WEST ENGLEWOOD, NEW JERSEY

SWIFT'S FLEXALS

new complex metallic wire drawing compound



FLEXAL MCA:

- For dry drawing
- High titer, metallic stearate base
- Very low moisture
- Homogeneous formulation
- Use directly in die box or cut —where required

FLEXAL "S":

- For dry drawing or—
- Hot dip coating
- Extremely high titer (water soluble stearate base)
- Uniform fine powder
- Contains rust inhibitor and bonding aid
- Very low in moisture

S-39

To Serve Your Industry Better **Swift** 102ND YEAR

and FREDDIE FLEXAL invites your further inquiry

SWIFT & COMPANY, Industrial Soap Dept.
4115 Packers Ave., Chicago 9, Illinois

☐ How can we place a trial order for Flexal for evaluation in our operations?

☐ Please send a FREE 10 lb. sample of Flexal for our evaluation.

(Please describe intended usage briefly).....

.....

Company.....

Address.....

City.....Zone....State.....

Your Name & Position.....

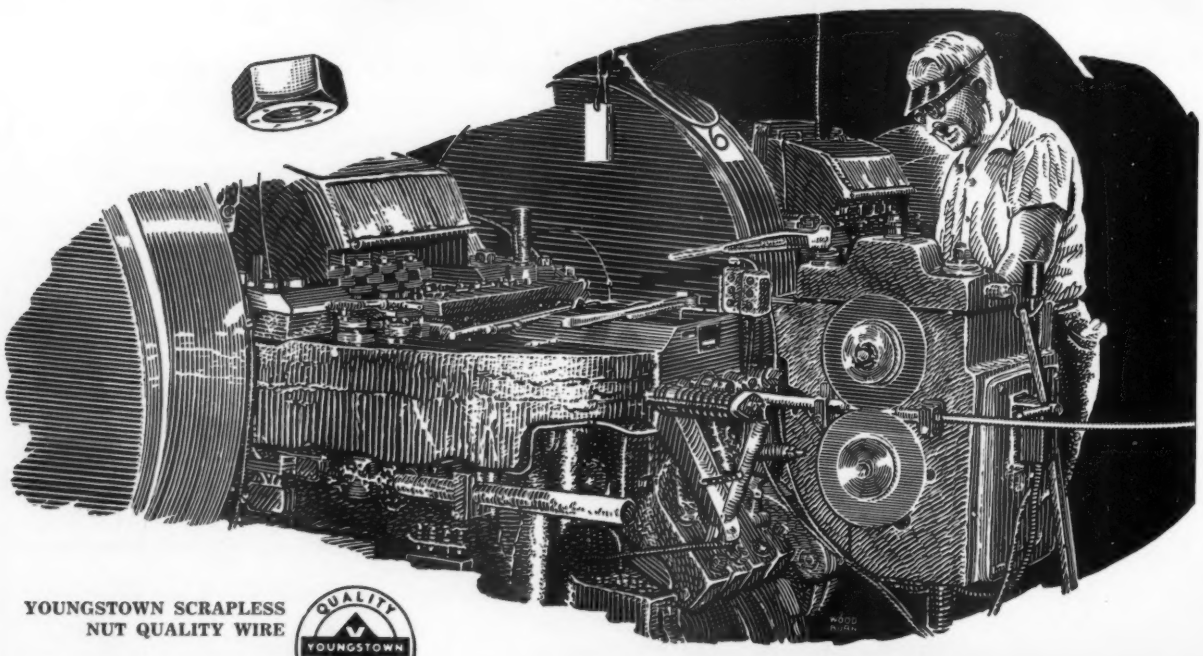
For over 50 years, leading manufacturers in all the major industries have used Gripco lock nuts to simplify production, lower manufacturing and maintenance costs and to improve the durability of all kinds of assembled products. To maintain this enviable reputation for outstanding product quality, the Grip Nut Company of South Whitley, Indiana, uses quality-controlled Youngstown Scrapless Nut Wire and Bars as basic raw material.

Because it comes to your plant free from all piping, injurious seams, laps, die marks, internal tearing and cupping, and non-metallic inclusions —Youngstown Scrapless Nut Quality Wire will provide increased production with fewer rejects which adds up to a healthy over-all profit boost. Also, its smooth coating extends die life thus minimizing costly die replacements.

YOUNGSTOWN SCRAPLESS NUT WIRE

Helps Maintain Quality of GRIP *Lock Nuts*

Youngstown Scrapless Nut Quality Wire is provided in special resulphurized steels as well as in standard AISI grades. Cold Heading Bolt Wire, of the same high Youngstown quality, is also available in all standard carbon and alloy analyses. Why not phone or write to our nearest District Sales Office for additional information or metallurgical assistance?



YOUNGSTOWN SCRAPLESS NUT QUALITY WIRE

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

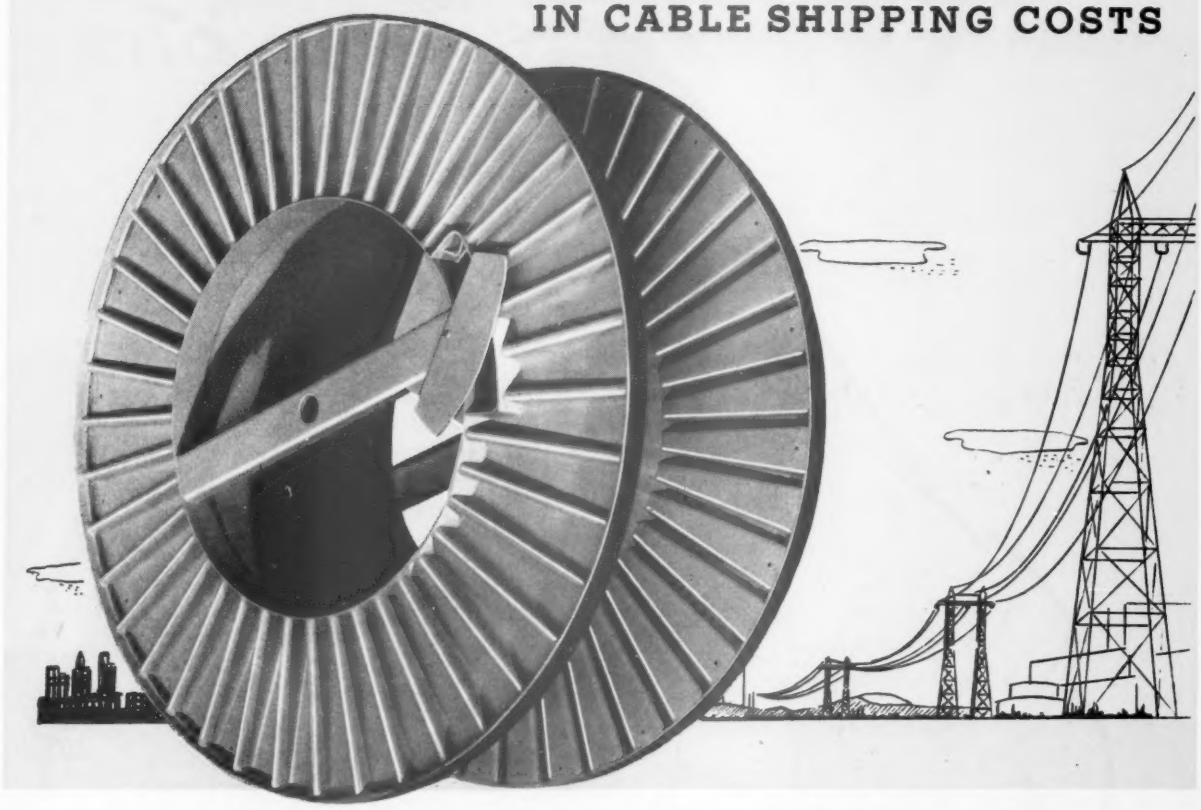
General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

20-YEAR RECORD REVEALS

GREAT REDUCTION

IN CABLE SHIPPING COSTS



EVANS LIGHT WEIGHT

TOROIDAL METAL REELS

25% AVERAGE WEIGHT SAVINGS PER REEL

Toroidal design helps cut weight and freight costs to a minimum. Permits easier, faster, lower cost handling.

OUTLASTS 5 WOOD REELS

Evans metal reels have a proven service life of 20 reel trips. Many thousands of these reels have *lasted over 50 trips.*

CUTS MAINTENANCE COSTS

Cost records show Evans reels effect a 50% savings over wood . . . when Evans special repair kit is employed.

For more complete information write to Chicago Sales Office: 208 South LaSalle Street.

THE GEORGE EVANS CORPORATION
MOLINE, ILLINOIS

broken sardines and cut fingers

You avoid broken sardines and cut fingers when you open stubborn cans with their handy keys—keys which are often made from special uniformly tempered, low carbon CF&I-Wickwire Can Key Wire.

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Clip Wire
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Drapery Pin Wire
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Fuse Wire
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Mattress Wire
Picture Cord Wire
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Pin Ticket Wire
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Stapling Wire for Preformed Staples
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"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
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Hose Wire, Vacuum and Defroster
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Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
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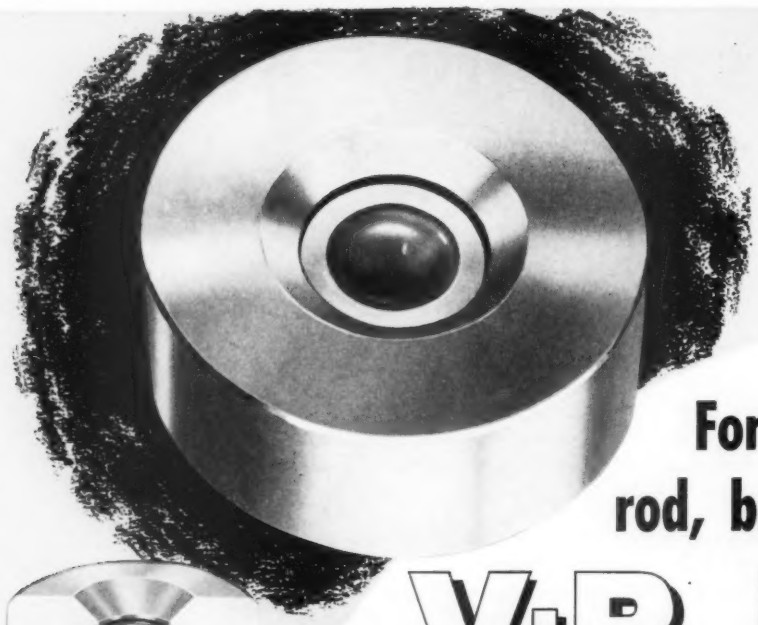

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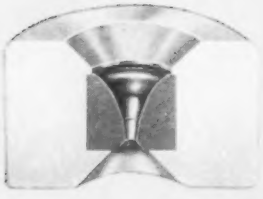

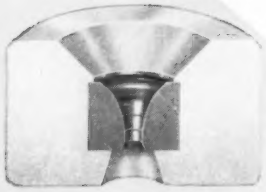

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The Wire Outlook

Opinion is divided on the future, with top business and university economists advising caution on 1958. Cross currents of economic forces and continued mild inflationary trends are expected to be manifest. The gross national product in dollars will be up somewhat and will probably run at an annual rate of $449 billions toward the end of next year. The words "decline" and "recession" appear frequently in the 200 or so opinions expressed and no real optimism was voiced. Wage rates and the cost of living are certain to rise. Real output may dip in the first half and rise in the second. Even the President has described the national economy as "taking a breather."

The Federal Reserve Board does not look for a dip and is conducting its operations accordingly. In some places an easing of credit will be made. Abroad, however, there is concern over the state of our economy. Stock market prices, both here and overseas have declined, which makes many people feel that matters are worse than they are in fact, although security prices were generally conceded to be on the high side.

Inventory buying has been cut and in some spots there are signs of inventory selling. Export trade, which has been high, will probably drop, because other countries are running low on dollars with which to buy. Consumer spending, while high, has not taken the spurt that many hoped it would.

Some key to next year's business will lie in auto sales. The 1958 cars are selling better at this point than last year and production schedules have been upped. Some business support will come from increased government spending. Housing starts are better than last year and the installment debt is at the all-time high of $33 billions, although it is not considered to be of burdensome proportions. The debts of families with incomes of less than $4000.00 a year are less than usual, so that the installment buying is being done by those who in the main can afford it.

Strikes will be frequent and general, from present indications, in the coming year. While these will affect business, the outlook is for a gradual improvement in our economy after the rash of work stoppages is over. The government's economic advisors are not convinced of a downturn. They see weak factors, but also note strong ones. Their opinions are based on continual contact with bankers, corporation executives and business leaders.

Military spending takes about half of our budget and, thanks to the Sputniks, this will be increased, delaying indefinitely the prospect of tax cuts we had been promised.

Manufacturers' wire orders have increased a little; tire bead wire is among the live items and some other wire lines have improved. Merchant wire and wire products are experiencing their usual seasonal tapering off. Most mills have plenty of open capacity and deliveries of rod and wire can be made promptly. Wire users have small inventories, with no incentive to build stocks in view of the supply situation.

Demand for cold heading wire has been spotty, although the screw business has been better. High carbon spring wire sales have not been too good. The automotive industry's wire buying has improved and if car sales hold up, some continuing support to the wire industry may be anticipated from this quarter.

Business may be said to be neither very good nor very bad. A big decline or a long period in the doldrums is not in the picture. The long range outlook is promising.

Edmund Duval Sickels
EDITOR

to the friends we've made
and the ones we hope to make—
a very

MERRY CHRISTMAS

—and a prosperous New Year!

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WIRE
AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 32 DECEMBER, 1957 No. 12

From Hot Rolled Rod to Finished Wire Through the Process of Mechanical Blast Cleaning

by Gilbert D. Dill
Process Engineer, Steel Division
Wheelabrator Corporation
Mishawaka, Indiana

Several years ago we presented a paper to this Association's National Meeting entitled "A Progress Report on the Development of the Wheelabrator Mechanical Cleaning Process." In one section we described our process for continuous blast cleaning of rod. Since that time we have demonstrated this process for many of your companies with varying degrees of success. **But!** we did not succeed, until recently, in getting an answer to your universal questions **"Where is it being used? What's the cost per ton?**

★ ★ ★

Today we will supply some answers. Since early 1956 experimental tests have been conducted by several large concerns, designed to provide data covering all of the factors involved in adapting the process to eliminate acid pickling and produce a satisfactory finished product. As a result of this work one company has installed three production lines; two other companies are each installing a line; and a fourth is operating an experimental line to secure further data with the aim towards elimination of acid pickling in a large new cold header plant.

Gilbert D. Dill

A paper delivered at the Annual Convention of The Wire Association on October 16, 1957, in Chicago, Illinois.

Mr. Dill has been active in the development of his company's method of descaling hot rolled steel mill products since 1944. He is a member of The Wire Association.

The process of mechanical blast cleaning is actually very simple. It consists of applying a metallic abrasive blast from several high speed centrifugal blasting wheels to the surface of hot rolled rod in the most efficient manner to obtain the desired cleaning or scale removal, at speeds dictated by subsequent processing.

★ ★ ★

Fig. No. 1 shows the method of blast application to clean one strand of rod in a single or double pass through the abrasive blast. The single pass cleaning rate is conservatively about 200 F.P.M. and the double pass rate is about 400 F.P.M.

★ ★ ★

Fig. No. 2 shows the same method applied to a single strand passed through the blast three times for a cleaning rate of about 600 F.P.M.

★ ★ ★

Fig. No. 3 shows the shot abrasive generally used in our process. This is Wheelabrator Steel Shot, a fully heat treated, cast steel round shot, having a nominal diameter of from .007" to .011". This abrasive is propelled by the wheels at a velocity of approximately 14,000 F.P.M. and does an excellent job of scale removal with no imbedment.

★ ★ ★

Fig. No. 4 is the type of surface left after blasting with the abrasive shown in Slide No. 3. It is a minutely cupped or etched surface which plays a very important role in retention of lubricant for cold drawing.

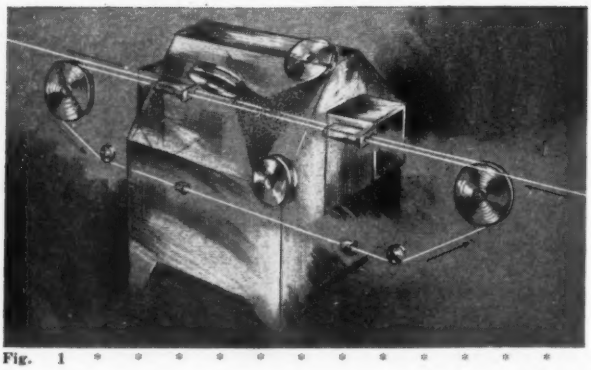


Fig. 1

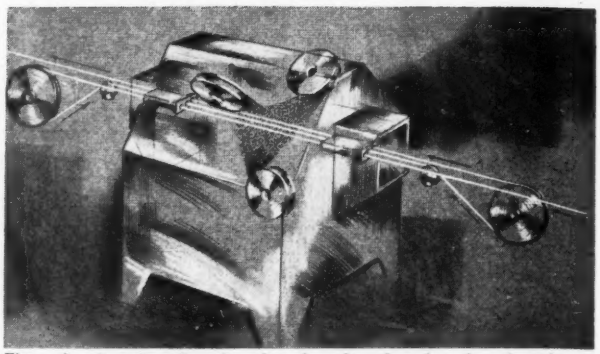


Fig. 2

Fig. No. 5 shows the rod in Figure No. 4 after phosphate coating and cold drawing through a single hole, using a dry lime and stearate drawing compound.

★ ★ ★

The actual single strand machine used in production is shown in Figure No. 6. The unit is equipped with three wheels located on 120° increments around the horizontal pass line center. The abrasive recirculating system constantly cleans the abrasive which is used over and over until it wears down to a nominal diameter of .004" or less.

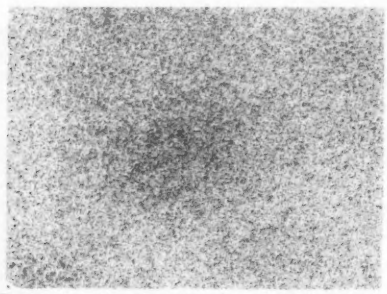


Fig. 3

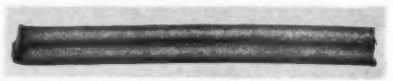


Fig. 4

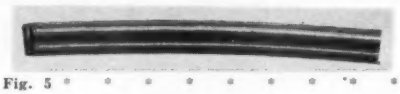


Fig. 5

★ ★ ★

At this point the air wash separator removes it to a scrap box. The replacement of this worn down abrasive represents the hourly cost of abrasive in the blast cleaning operation.

★ ★ ★

A dust collector, not shown, is always connected to one or more blast cleaning machines. This provides a negative pressure to the entire unit enabling the separator to remove fines and insure a dust free operation.

★ ★ ★

Three installations of machines of this type are in operation cleaning rod ahead of a single hole draw block. By the first of the year an additional unit will be in operation.

★ ★ ★

There are also two other machines of a different type being installed to clean eighteen strands in a single pass after a patenting furnace.

★ ★ ★

In addition, there has been in operation for about two years a

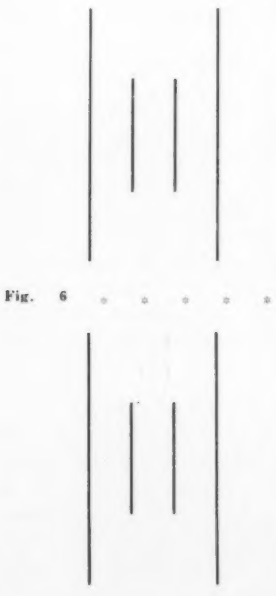
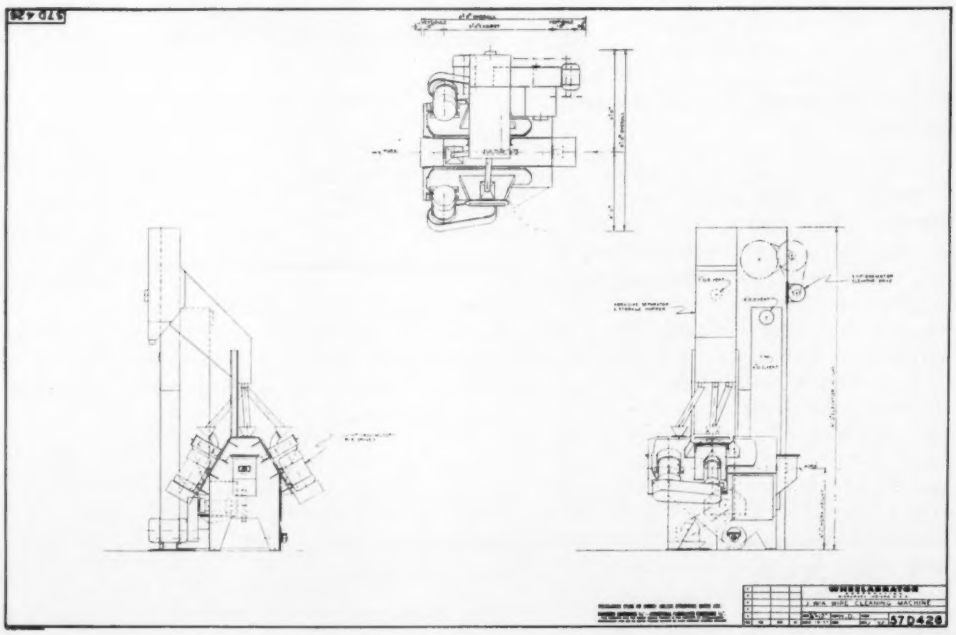


Fig. 6



special type or machine cleaning five lengths of hot extruded carbon steel bars in one pass in preparation for cold drawing.

★ ★ ★

The following brief descriptions of these various operations will show the versatility of the mechanical cleaning process and the equipment required.

A. Single Strand Single Pass Cleaning and Drawing Line

This type of line is being used for rod ⅝" diameter and larger. It consists of a capstan or spindle type payoff, welding station (usually portable), a powered roller leveler, blast cleaning machine, lime or phosphate coating and drying equipment followed by the bull block. Pictures of this installation are shown in the following illustrations.

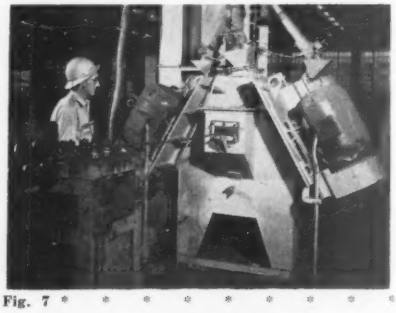


Fig. 7

Fig. No. 7 shows the leveler and the entrance end of the blast cleaner as shown in Figure No. 6.

Fig. 8

Fig. No. 8 shows the cleaned rod leaving the blast cleaner.

★ ★ ★

Fig. No. 9 shows the phosphate coated rod entering the bull block.

★ ★ ★

In operation the blast cleaner is

Fig. 9

automatic. The control on the abrasive flow to each wheel unit is activated by the bull block control so that the abrasive flow is stopped and started in conjunction with the drawing operation.

★ ★ ★

Speed of cleaning of this line is about 200 F.P.M., depending on the diameter of the rod and its scale condition.

★ ★ ★

To date our customer has not operated this line long enough to produce an accurate over all cost per ton. Preliminary figures indicate, however, that there will be a substantial saving as compared to present pickling and liming, with separate drawing operations.

★ ★ ★

We can, however, give you fairly accurate costs on the blast cleaning operation as follows:

Abrasive consumed per blasting hour = 12# @ 12½¢ lb. =	$1.50
Spare parts and maintenance labor per blasting hour =	.60
Power per blasting hour = 60 KWH @ 1¢ =	.60
Total cost per blasting hour =	$2.70

★ ★ ★

The blast cleaning cost based on processing ⅝" diameter rod at 200 F.P.M. would be 43.2¢ per ton for one hour's continuous operation at 100% efficiency. This figure would be adjusted upward depending on down-time of the drawing operation.

★ ★ ★

The latest detailed acid pickling costs which have been secured, covering a months operation, are as follows:

Direct labor per ton =	$0.37
Acid per ton =	.58
Lime per ton =	.03
Total per ton =	$0.98

★ ★ ★

This cost does not include such items as acid disposal, maintenance and transportation from the pickle house to the wire mill nor any fixed charges.

B. Single Strand Double Pass Cleaning Line

This type of line is being used for rod ½" diameter and smaller. It is the same as the line above except conventional flipper type payoffs are used. Through the use of turn-around sheaves the rod is passed through the blast cleaner twice.

★ ★ ★

Because of the double blast, which the rod receives, this line has a cleaning rate of about 400 F.P.M., depending on the diameter of the rod and its scale condition.

★ ★ ★

The cost of the blast cleaning operation per blasting hour is the same as the line in "A" above, namely $2.70.

★ ★ ★

The blast cleaning cost based on processing ⅜" diameter rod at 400 F.P.M. would be 60¢ per ton for one hour's continuous operation at 100% efficiency. This figure would be adjusted upward, depending on down-time of the drawing operation.

C. Eighteen Strand Cleaning Line

Mechanical blast cleaning of multiple strands of rod is not new. It has been in use in Germany for several years. However, the application of our process to clean eighteen strands after a patent furnace is new and is being installed by two companies who expect to be in production after the first of the year.

★ ★ ★

The blast cleaning equipment used and the method of blast application are shown in Figure No. 10.

★ ★ ★

This is a four (4) 30 H.P. wheel machine designed to clean eighteen strands of high carbon rod after a lead patenting furnace. You will note that in this machine the wheel units are blasting at right angles to the pass line and are

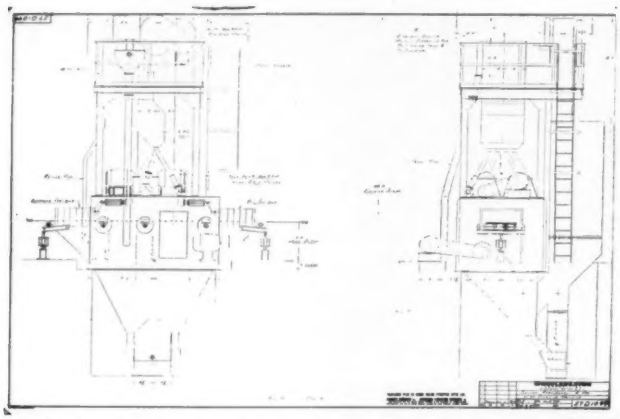


Fig. 10

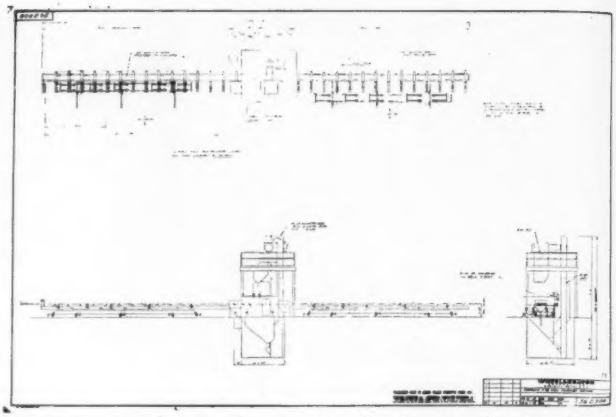


Fig. 11

located to ensure cleaning of 90° of each strand by each wheel. Conventional abrasive recirculating and cleaning equipment are used and the entire system is connected by piping to a dust collector.

★ ★ ★

This same design can be used for a larger number of strands by increasing the number of wheel units. Higher speeds may be obtained by increasing the size of the wheels and their motor drives.

★ ★ ★

The two machines now being installed in new lead patenting lines will clean all of the various diameters of rods for which the lines are designed.

★ ★ ★

One of these consists of multiple payoff capstans, lead patenting furnace, a cooling zone, blast cleaning unit, hot borax dip tank and multiple strand recoiling equipment.

★ ★ ★

The operation of this line is the same as conventional patenting lines except for the cleaning and coating processes which eliminate the customary trip through the pickle house. The recoiled rod is ready for cold drawing without any further treatment.

★ ★ ★

The line will operate at cleaning speeds of from 30 to 60 F.P.M. as dictated by the patenting speed for the various diameters of rod being processed.

★ ★ ★

The estimated cost per hour of the blast cleaner in this type line is as follows:

Abrasive consumed per blasting hour = 28# @ 12.5¢ per lb. =	$3.52
Spare parts and maintenance labor per blasting hour =	1.20
Power per blasting hour = 120 KWH@ 1¢ =	1.20
Total cost per blasting hour	$5.92

★ ★ ★

The cleaning cost based on processing eighteen strands of ¼" diameter rod at 60 F.P.M. is $1.15 per ton for one hour's continuous operation at 100% efficiency. This figure should be adjusted for changes in rod diameter, no downtime is expected due to furnace operation.

D. Multiple Bar Stock Cleaning Line

This line is in operation blast cleaning hot extruded carbon steel shapes of special cross-section as well as extruded conventional round, square and hexagonal bars. It is equipped with a blast cleaning machine and conveyor similar to that shown in **Figure No. 11,** except for the conveyor feeding and discharge equipment.

★ ★ ★

The line shown consists of an automatic feeder, a five pass line conveyor, a four (4) 20 H.P. wheel blast cleaner and an automatic unloader. The line is designed to handle five bars at a time ranging from ¾" to 4" in diameter at cleaning rates of from 10 to 30 F.P.M.

★ ★ ★

In operation, five bars are placed on the feeder which then transfers the bars to their respective pass lines on the conveyor. They are then moved through the blast cleaner and all glass lubricant and scale is removed. The unloader then picks up all bars at once and places them in a lift rack for bulk handling by an overhead crane.

★ ★ ★

Pickling is not required before cold drawing except for those special shapes which must be acid pointed and these are only given a short flash pickle to remove corrosion and dirt acquired during the pointing operation.

★ ★ ★

The estimated cost per hour of the blast cleaner in this line is as follows:

Abrasive consumed per blasting hour = 16# @ 12½¢ per lb. =	$2.00
Spare parts and maintenance labor per blasting hour =	.80
Power per blasting hour = 80 KWH @ 1¢ =	.80
Total cost per blasting hour =	$3.60

★ ★ ★

The blast cleaning cost based on processing five 1-½" diameter bars at 20 F.P.M. is 20¢ per ton for one hour's continuous operation at 100% efficiency. This figure, however, should be adjusted upward since this type of cleaning must of necessity be more or less intermittent. Thus, if we use an efficiency factor of 80% the cost would be 25¢ per ton.

★ ★ ★

We have conducted many tests to develop the cleaning data for all sizes of hot rolled rods and bar stock.

(*Please turn to page* 1528)

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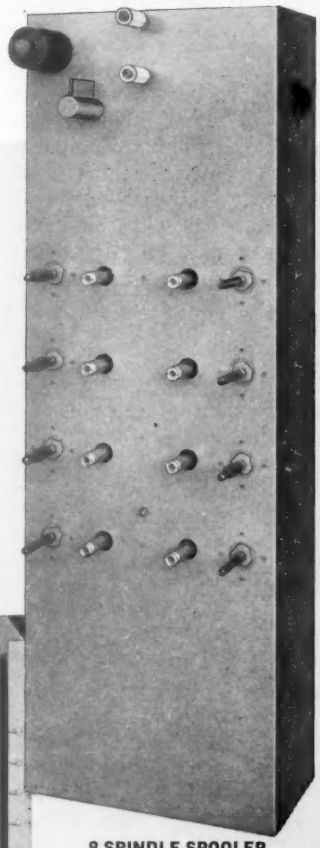
and build

SPECIAL MACHINES

to suit your special needs



Here's an example...

A customer of ours had a spooling problem involving space limitations for a given number of spindles, and asked us to design a take-up machine conforming to his specifications.

We like that kind of assignment, and our engineers came up with a machine occupying only *two square feet* of floor space, yet offering 8 variable speed, individually motor-driven, torque controlled spindles. That's the machine you see at the right—and we're now filling orders in quantity as you can see in our factory picture below.

Maybe you can use this same machine to advantage, but the main point is that we can design and build just about any special machine you may need to fit a specific purpose . . . either our design, your design or a combination of both.

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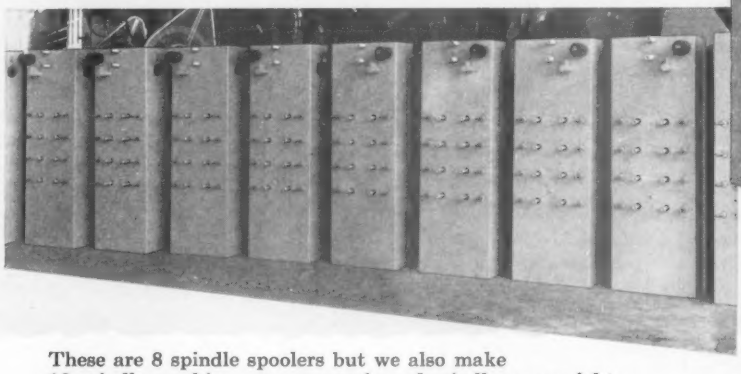
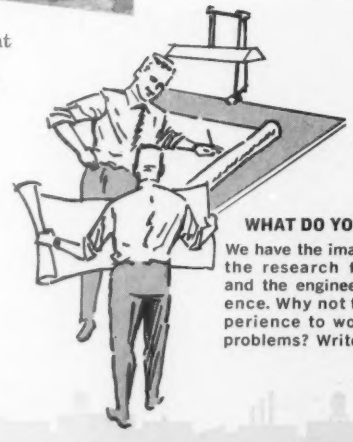


8 SPINDLE SPOOLER

The 8 spindle cabinet spooler shown above is only 24" wide, 12" deep, 72" high.

These are 8 spindle spoolers but we also make 16 spindle machines or any number of spindles you might want on a machine. Spindles are individually motor driven by a torque motor (860 rpm) with torque control giving variation from zero to 30 ounce-inches. Traverse mechanism, electrically controlled, is also individually motor driven. Traverse range varies from zero to 4" or 4" to 6". Machine accommodates full range of spools from 2½" head D. to 6" D.



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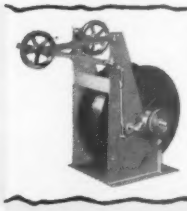
We have the imagination . . . the research facilities . . . and the engineering experience. Why not tap that experience to work on your problems? Write or call us.

Another example



LET-OFF STAND

The development of large reel-less packages created the need for an improved Let-off Stand. Our design incorporates an automatic tension-breaking device, plus an easy means of loading and unloading.

ACROMETAL PRODUCTS, INC.

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Mechanical Blast Cleaning of Wire Rods

by Kenneth J. Sorace
Chief Project Engineer
The Lamson & Sessions Company
Cleveland, Ohio

This is a paper about a process. It is thought to be of interest to the industry. My Company, **The Lamson & Sessions Company,** makes nuts, bolts and fasteners that are used all over the world. Our desire to investigate mechanical descaling was prompted by many reasons, among them pressure by the local community to eliminate the dumping of waste pickle liquor in the sewers. Pickled, limed and drawn wire was satisfactory for much of our production. Pickled, phosphated and drawn material sufficed for others. Special processing and coatings fulfilled the remaining requirements.

★ ★ ★

We ran a survey to determine the cost of reclaiming or neutralizing the waste pickle liquor. Many methods were proposed which were expensive to build and operate. The most recent development is a process being developed by Lee Wilson Engineering. We cooperated with them to set up an experimental unit in our present Cleveland pickle house where they hope to prove its merits. The cost of such a process, although not prohibitive, indicates that money may be profitably spent to investigate other methods of producing clean drawn wire for boltmaking and cold heading applications.

Kenneth J. Sorace

Mr. Sorace graduated from Cornell University in 1940 as an Electrical Engineer. After a brief period as a Laboratory Engineer with the Rochester Gas & Electric Co., he entered the U.S. Army Air Force. He flew fighters in combat in the E.T.O. and spent some time in Research & Development at Wright Field. He joined Lamson & Sessions in 1945 as a Project Engineer. Except for 18 months in 1951 and 1952 on Active Duty with the Air Research and Development Command in Baltimore, he has been in Development work with the company since the war.

He presented this paper at the Annual Convention of The Wire Association in Chicago, Ill., on October 16, 1957.

I'm sure many of you are familiar with the papers presented here in Chicago at the 1953 Wire Association Meetings. Of all the processes described, the only one that appeared promising from a fastener manufacturer's standpoint seemed to be shot blasting. It was stated that a clean (scale free) surface would result from the blasting. Where extrusions and other forming operations follow the wire drawing, a good lubricant coating is essential. Many of the processes would produce wire but few appeared to lend themselves to the production of sufficient lubricant coating for boltmaking in "Solid" dies. There were many other unanswered questions, some of them economic in nature.

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Up to this time, although several companies had shot blasted sample coils, no pilot line or full scale shot blasting operation of wire rods had been done. Evidence indicated such a line was possible provided the "bugs" could be worked out.

★ ★ ★

We contacted manufacturers of

(*Please turn to page* 1520)

Figure 1—A general view of the lines set up for drawing with lime coating. Two lines can be seen with the flipper for line #1 at the left.

Figure 2—A view from the shot blasting end showing the turn around sheaves, flipper and wire block.

Progress in Vertical Rod Storage

by A. F. Anjeskey
Sales Manager
Cleveland Tramrail Division of
The Cleveland Crane and Engineering Company
Wickliffe, Ohio

This paper, somewhat a sequel to an earlier one by the author, was delivered before the Annual Convention of The Wire Association in Chicago, Illinois, on October 14, 1957.

In a paper presented to this Association in October, 1950, a vertical rod storage system was described, with data showing the advantages of such system.

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This installation was made in a nut and bolt plant in 1949 in Rock Falls, Illinois. Unfortunately, you will recall that in that period rod was scarce, and the incoming rods shipped to this plant could not be stored because they had to be processed immediately and were delivered to the cleaning house from railroad cars. Consequently the user did not install stanchions to permit vertical storage until recently, but experimental stanchions were installed, from which was developed data that is quite interesting.

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As a comparison, storage of rod horizontally, with some semblance of separation of categories of rod, permits storage of about 400 lbs. of rod, requiring upwards of 75 lbs. of binning steel per square foot of effective area. The vertical system in addition to permitting complete separation of rod categories provides storage of 1000 lbs. and upwards, requiring 55 lbs. of binning steel in the form of pipes, per square foot of storage area.

Fig. 1

★ ★ ★

This plant, now being in a position to obtain all the rod it requires, has finally installed 83 wells in an area 37′ x 45′, or approximately 1665 square feet, and, based on the data developed by the experimental installation, provides storage of 10 tons per well or 830 tons minimum in the area mentioned. Additional pipe stanchions will be installed as required, eventually completing the installation of wells in the entire rod warehouse.

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It is interesting to mention that the original requirements of this plant had to provide for storing 60 sizes, heats and alloys, which has since been increased to 96 due to the change in specifications of customers, and it can be appreciated that with the additional categories of rod used, storage by the horizontal method would have been very inefficient, requiring additional rod warehouse space, and an additional investment in handling equipment and binning steel.

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In 1955 a second installation was made in another bolt and nut plant in Cleveland. The original plans called for a building 100′ x 400′, provided with a four-runway crane. Due to the savings in storage area, this plant has saved 60% of the area originally allocated for rod, and the present storage area is approximately 5000 square feet with 219 wells, permitting the storage of 1650 tons.

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The two installations have confirmed the advantages claimed for vertical storage; additional advantages will be possible when rod mills are willing to accept the trend toward packaging or unitizing coils by proper banding with flat strapping or wire.

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If other products such as rolls of paper weighing 6000 lbs., 60″ in diameter x 72″ long or baled pulp weighing 350 lbs. per bale, can be stored 40′ to 42′ high by proper banding and handling equipment, why is it not possible to properly band coils of rod?

★ ★ ★

At the May regional meeting of this Association in Hamilton, Canada, **Mr. J. Laver** of the Steel

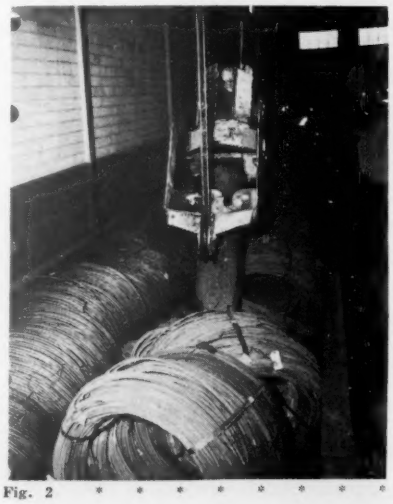

Fig. 2

You know Ed Henry of Hedalloy Die Corporation. He says . . .

"I can rely on ELGIN grading"

. . . and precision grading is a must for highly finished work surfaces where scratches cannot be tolerated.

The inset illustration shows the world's largest boltmaker die, made by Hedalloy Die Corporation—one foot long and nearly seven inches in diameter! Because a single scratch during finishing would mean a loss of countless hours of work, Hedalloy specified Elgin Precision Graded DYMO-C* . . . to be sure.

*C for carbide

Elgin Diamond production is laboratory controlled through every stage to assure absolute particle size uniformity, conforming to Bureau of Standards limits. Make your own microscopic check or ask your Elgin man to show you visual proof of Elgin's *reliable* grading accuracy. Whenever your products call for dependable abrasives, specify ELGIN DIAMOND.

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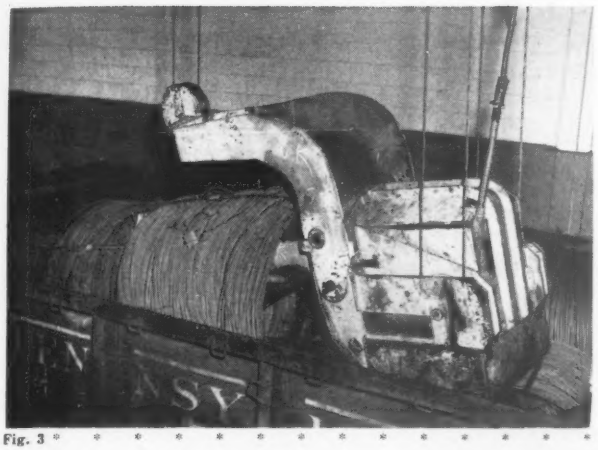

Fig. 3

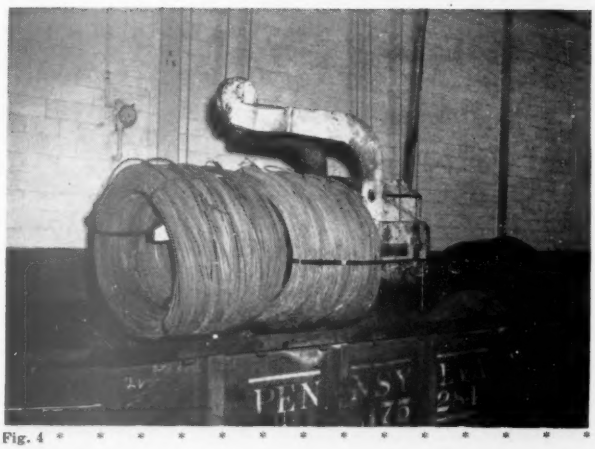

Fig. 4

Company of Canada presented a paper describing the possibilities of reducing handling costs, decreasing storage area by compacting coils into unit loads of 4000 lbs. and banding with two ties, which reduce the length of the load so that even greater tonnage per square foot of storage area is possible than stated in the forepart of this paper. Incidentally, the Hamilton mill can store as many as 350 categories of rod and the rod warehouse, 110′ x 700′, is presently equipped for storing horizontally with a 5-runway crane. It has been estimated that the horizontal storage provides for storing 8500 tons, whereas vertical storage in this same area would provide storage for 25,000 tons. It is obvious, therefore that a considerable saving in building cost, steel storage bins and handling equipment could have been made; the total investment in vertical storage more than pays for itself.

Fig. 5

Regardless of the advantages of banding coils for increasing storage, the increase in individual coils rolled, has jumped from the conventional 300 lb. coil to 600 lb., 900 lb. and upwards; larger, heavier coils present a handling problem that can only be solved with proper banding to obtain the maximum benefit in the succeeding operations of drawing rod into wire, eliminating snarls or tangles of individual turns and operate wire drawing blocks at maximum

(*Please turn to page* 1535)

Fig. 7

Fig. 6

Fig. 8

Buried Distribution for Telephone Circuits

by C. C. Lawson
Plant Facilities Engineer
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey

Mr. Lawson presented this paper at the Annual Convention of The Wire Association in Chicago on October 15, 1957. In it he describes some of the problems connected with buried wires and measures that have been taken to provide coatings that will satisfy local conditions found in various parts of the country.

"Buried" construction in the telephone plant is that in which cables or wires are placed directly in the ground without supplementary protection. It is used in rural and urban distribution of circuits and in toll and trunk routes across country. The cable is placed either by a specially designed cable plow or by laying it in a trench. This construction contrasts with "underground construction", a term applied to a type of construction in which the cables are housed in underground conduits for protection from damage by heavy traffic and from the digging of other utilities. Here the provision of additional ducts at the time of construction is an important feature for later expansion.

★ ★ ★

In rural areas where houses are widely separated, wires and small cables, sometimes as small as 6 pairs, are used. These wires and cables are usually buried directly in the road, if it is of an unimproved type, or in the shoulder if the road is paved. They are generally placed with specially designed plows drawn by or mounted on a tractor.

★ ★ ★

In urban areas, the greatest application of buried distribution has been in large housing developments where the buildings are built on a production-line basis. This type of development is characterized by large scale efforts of many sorts being carried on at the same time. Streets and sidewalks are being laid while sewers, water and gas mains are being constructed. Both the telephone company and the power company must place their facilities while all of the other construction is under way.

In typical urban distribution, the cable is placed in a trench which has been dug in an easement, usually along the rear property line. The service connections are made at terminals through which the cable has been looped and the service wires are placed in trenches cut as laterals away from the main cable trench to the individual houses.

★ ★ ★

Buried distribution is not new. An article describing the advantages over aerial distribution appeared as early as 1917 in the magazine **Telephone Facts** where it was stated "Nothing but skepticism can prevent the early adoption of this system of construction, because it is practical, the best of service, the least liable to interrruption, less expensive of upkeep, and all in all, the cheapest construction possible." However, the cost penalty for placing wires below ground was generally considered to be excessive at that time and for many years thereafter, in view of the well engineered materials and methods used in aerial construction.

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In recent years, the damage to aerial wires and cables caused by the increasing number of hurricanes and tornadoes which have passed through areas of dense telephone concentration (Figure I) and the changes in building construction in suburban areas where ranch type homes and other low modern houses accentuate the conspicuousness of pole distribution have caused strenuous effort directed toward the development of methods and materials for locating telephone plant below ground. Also, previous experience has shown that placing of plant below ground has protected it from many hazards to which aerial plant is exposed and which have been the cause of widespread interruptions to telephone service. Of course, some new hazards are encountered when the plant is placed below ground, but these tend to cause only localized effects.

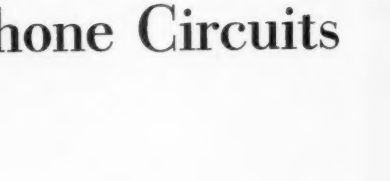

Fig. 1—Damage to aerial telephone plant by wind storm.

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Recent developments in the wire and cable field have been a significant factor in making possible a large increase in buried distribution. These developments, coupled with improved methods of placing and terminating, have made this type of construction economically feasible. Polyethylene - insulated cables with combination aluminum and extruded plastic sheaths are being used successfully in both rural and urban buried distribution.

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In order that buried construction be competitive in price with aerial construction it is desirable that the cables and wires be no more expensive than their aerial counterparts. This precludes the

use of expensive types of armor or lightning protection for the cables except in special areas, such as gopher-infested territory or where lightning exposures are severe. Accordingly, in the early stages of expansion into buried distribution, use has been made of the same cable as used in aerial construction. This cable uses color-coded polyethylene as the conductor insulation and has the core wrapped with a non-absorbent composite tape of rubber and Mylar. The wrapped core is enclosed in aluminum tape applied with an overlapped seam and the outer jacket is extruded polyethylene compounded for maximum life exposed to the elements. This is the familiar "alpeth" sheath. The cable is furnished in 19, 22, 24 and 26 gauges. The thickness of insulation varies from 0.012″ on 19 gauge to 0.0065″ on 26 gauge to provide a capacitance of 0.083 mf per mile. The aluminum tape is 8 mils thick and is corrugated for flexibility on cables having a core diameter over 0.67″. The outer polyethylene jacket is 65 mils thick on cables up to 0.88″ in diameter and increases for the larger sizes. Another sheath has been specifically designed for use in buried installations to provide greater protection to the conductors from lightning and from the entrance of water. This sheath is similar in construction to the alpeth design: the additional protection is provided by an extruded layer of polyethylene between the tape wrapped core and the aluminum sheath. The construction details of these cables are shown in Figure II.

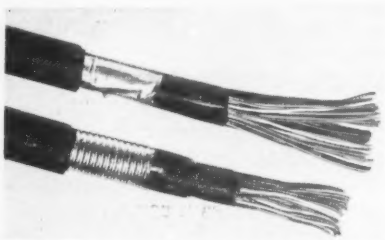

Fig. 2—Designs of cable for buried distribution.

The alpeth cable sheath provides adequate protection for the insulated conductors in the cable against the usual underground environment and from most lightning storms. Some of these cables have been buried for several years and the experience has been good. However, the period of exposure has not been long enough to fully determine the extent of the hazards to which this type of cable is exposed when buried.

* * *

These sheaths, however, are not rugged enough to protect the cable from damage by digging in the vicinity, from chewing by rodents such as gophers, or from damage by lightning where exposures are severe. Additional protection is required in these instances. For protection against gophers, when this is necessary, a single serving of 0.010″ steel tape is used. In providing this tape armor, kraft paper tape is first applied over the jacketed cable following which the cable is flooded with asphalt and served with the steel tape. The tape is applied with a slight opening between turns for flexibility. A jute serving flooded with asphalt is applied over all to provide corrosion protection for the steel. For additional protection under the most severe lightning conditions, the use of a shield wire or other standard method is required. This is very rarely done with distribution cables.

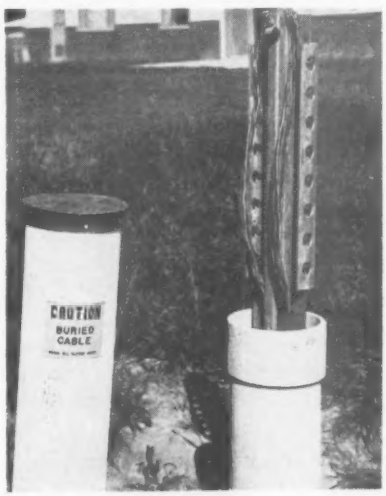

Fig. 3—Terminal for connecting service wire to distribution cable. * * * * * *

The plastic insulation, unaffected by moisture, lends itself to the use of the "ready-access" type of subscriber connection; it is only necessary to remove the cable sheath in a terminal box to make all wires in the cable accessible (Figure III) so that a subscriber connection can be made to any one of them. Since it is not necessary to hermetically seal the terminal, the cost for terminations is relatively low.

* * *

In general, above-ground terminals are used. The ready-access terminals in use are extremely functional in design but at the same time do not present a displeasing appearance. They utilize a steel fence post for support with a plastic terminal strip mounted on it near the top where it is protected from flooding and is easy to work on. A cover over the terminal protects it from the elements.

* * *

Another method for providing service connections is splicing the service wire directly to the distribution cable. This method requires somewhat better coordination during construction and also cuts down flexibility in the use of cable pairs. However, by using plastic materials to make the splice closure, a good connection can be made for several subscriber loops at one splice point, and the cost both in materials and in time is low enough to make this method attractive in spite of the associated penalties.

Fig. 4—Buried service entrance wire. * * *

For urban distribution a new type of wire has been developed (Figure IV) to provide the service connection between cable and house. This wire facility provides two pairs since there is an increasing demand for two lines in many subscribers' homes. The conductors are of No. 20 AWG 40% conductivity annealed copper-steel for strength and flexibility and are insulated with 0.012″ of color-coded polyethylene. The pairs are arranged as a spiral four quad, having a 2½″ lay and with pairs being formed from diagonally opposite wires. A thin PVC jacket is extruded over the quad to hold the wires in place. This forms a cylin-

drical core approximately 0.185" in diameter. An aluminum tape, 4 mils in thickness, is wrapped helically over this core with a 50% overlapped seam. An outer black PVC jacket, approximately 22 mils in thickness, completes the structure. The aluminum tape provides protection from insects, but it is not adequate to protect the insulated conductors from damage by rodents or digging implements. The tape is used also as an electrical shield to be grounded both at the point of connection to the cable and at the subscriber's house. This is particularly important in areas where there may not be public water supply or in locations where there may be severe lightning exposure, such as a long run on an isolated hill.

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The wire weighs 36 pounds per thousand feet and has a breaking strength of 200 pounds. It is furnished on reels in lengths of 5000 feet. Its electrical characteristics are as follows:

TABLE I

Electrical Characteristics of Buried Service Entrance Wire

Conductor Resistance	—	52 ohms, average, per 1000 circuit feet at 68° F
Mutual Capacitance	—	0.021 mf, average, per 1000 feet
Attenuation	—	0.51 db per 1000 feet at 1000 cps
Insulation Resistance	—	10,000 megohms — 1000 feet, minimum, at 60° F
Breakdown Voltage	—	8,000 volts rms, minimum, between conductors and from conductors to tape

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One of the big problems in buried distribution is the design of equipment for burying the cables and wires by the plowing or trenching methods. The plows are of special design, the main features of which are narrow width, deep share, and the presence of a tube for feeding the wire or cable to the bottom of the slot cut by the plow. (Figure V) The trenchers used may be any of several types depending on the extent of the job, the type of digging encountered and the room necessary to maneuver. In general, desirable features in the trencher are ability to dig and backfill a narrow trench, enough power and ruggedness to dig in most soils and the mobility required to get to and move around the job.

Fig. 5—Small plow for direct burial of wire and cable.

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The depth of placing buried wires and cables may vary from a few inches to several feet. The desirable depth, of course, is that which is most economical both as regards initial cost of placing and the cost of maintaining the cable. This depth varies with the location in which the cable is plowed; some general rules being that on private right-of-way in the country it should be below the depth where subsoilers reach, and on public right-of-way in road beds or along road shoulders it should be deep enough to avoid being damaged by road maintenance equipment. This generally calls for a depth greater than 16 inches. In urban areas where the "do-it-yourself" gardeners are at work, sufficient depth must be maintained.

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With the increasing volume of construction of buried plant there is a need to review the safety considerations affecting people and plant where telephone and power distribution plant are in close proximity underground. In the aerial plant, clearances between the two have been well established and have proven practical in many years of usage. While agreements exist regarding separation of facilities below ground and safety regulations have been adopted on the basis of these agreements, a review of the regulations is being carried out by a committee comprising interested engineers from Edison Electric Institute and the Bell System. The studies have the general objectives of determining: (1) minimum depth for placing both types of plant, (2) horizontal and vertical separation between the two, (3) protection required at crossover points, and (4) the development of methods of coordinating construction and of locating and identifying each service. It is anticipated that the results of this study will become the basis for any modifications in the National Electric Safety Code that may appear desirable.

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We would be naive if we did not realize that buried cable and wires may be subject to attack by animals, insects, and even bacteria and fungi. The materials used in design of the wire and cable and those materials which will be used at splices must last a long time. Studies are underway to determine the effects of subterranean environments on the wires, cables and their components. Some of these samples are being placed in areas of high biological activity, others in arid soils, while still others are buried where they are exposed to insect and rodent attack.

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There are other sources of potential troubles in these buried structures, such as breaks in the outer sheathings which may occur during placing operations, or subsequently by frost heaving of the ground or by people digging in the vicinity. Some of these injuries will be sufficient to permit water to enter the cable structure, and while this may not cause recognizable conductor trouble at this point, it may lead to difficulties at some rather remote point in the cable when the water flowing along the cable reaches a conductor with damaged insulation. Every effort is being made in manufacture to keep the insulation intact, but there will be occasions where the insulation is damaged. Location of the source of entry of the water and its removal are problems now being studied actively.

(*Please turn to page* 1526)

ADJUSTABLE DRAW-CAST DIE BOX
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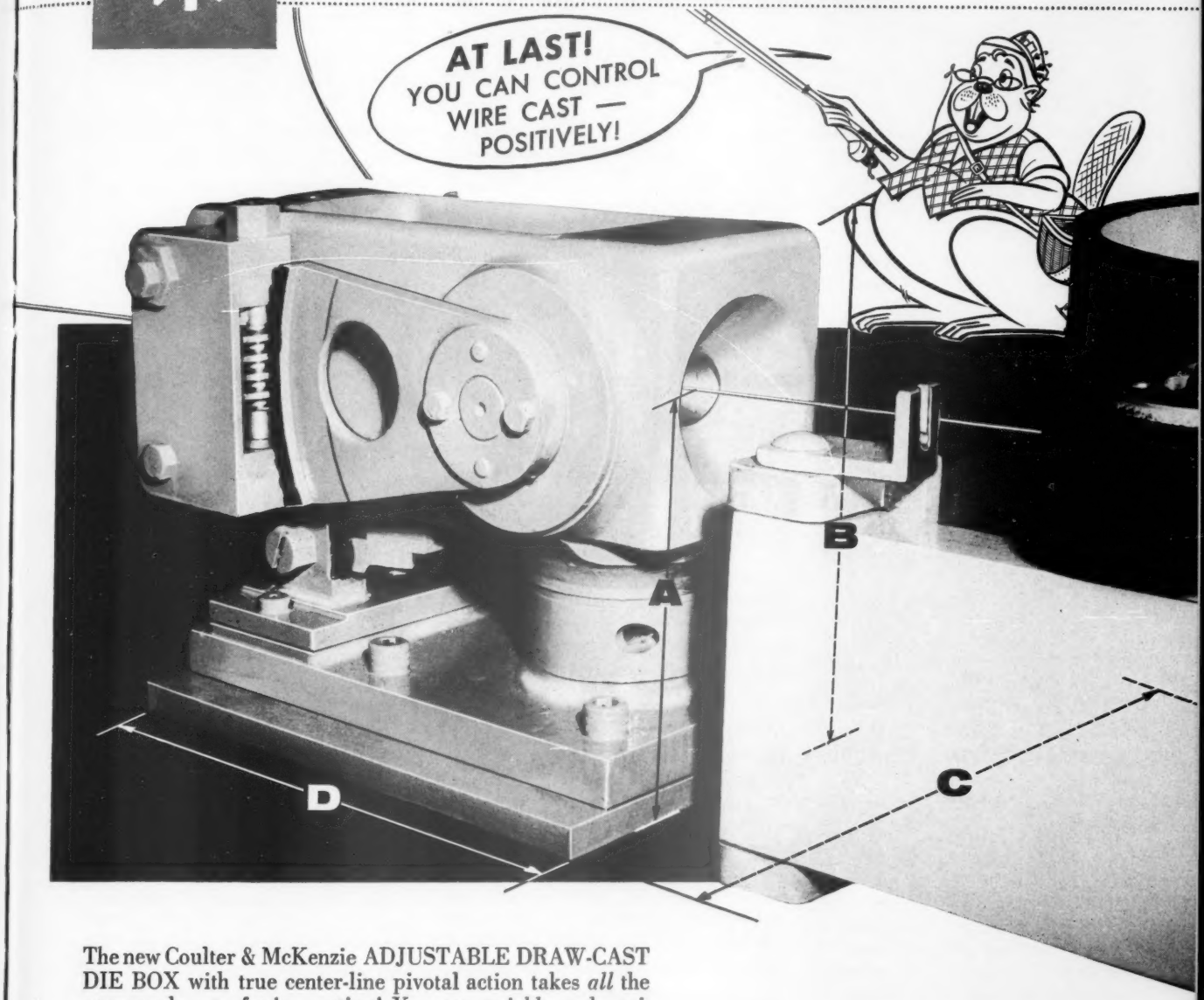

The new Coulter & McKenzie ADJUSTABLE DRAW-CAST DIE BOX with true center-line pivotal action takes *all* the guesswork out of wire casting! You can *quickly* and *positively* establish the desired loop diameter and pitch of your wire with just 2 simple adjustments.

LOOK AT THESE ADVANTAGES:

1. Positive Adjustable Control of cast and pitch.
2. Completely eliminates or greatly reduces skilled use of casting rolls.
3. Positive locking of controls and die insures uniform constant cast, coil after coil.
4. Graduated indication permits keeping records for quality control and duplication when changing sizes or analysis.
5. Easy to install on most types of wire drawing equipment.

MODEL NO.	MAX. DIE SIZE CASING O.D.	NET WEIGHT	DIMENSIONS			
			A	B	C	D
1	1"	8 lbs.	2⅝"	4"	6"	4½"
2	1½"	14 lbs.	2⅞"	4½"	6½"	5"
3	2"	125 lbs.	7¼"	10½"	9½"	12½"

Model No. 3 (Illustrated) may be arranged for direct water cooling of die casing.

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Color Dynamics for the Modern Wire Mill

by Albert S. Keshen
Newark, New Jersey

This article describes a new technique that is contributing to safety and efficiency in a wire mill. Color dynamics is relatively new to the wire industry and is worthy of more widespread consideration.

The new science of color dynamics, which involves the scientific utilization of the energy in color to promote efficiency in industry, is making for more pleasing working conditions and helping to increase the safety factor at the **Wilbur B. Driver Company** of Newark, N. J., melters and manufacturers of electrical resistance alloys.

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Its principal advantages are: (1) The banks of machines present a pleasing picture, in fact are quite beautiful; (2) it is restful on the eyes of the operator, resulting in less fatigue, better work, lower costs; (3) the operator develops a sense of pride of ownership so that he takes better care of the machine which, of course, lowers the cost of upkeep and maintains accuracy; (4) it enables the foreman to tell at a glance if the machine is being taken care of properly.

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This new production technique involves the application of visual focal paint to machine parts. It has long been recognized that color has a marked influence on both the worker's morale and his rate of production. Color, properly used on machinery, also makes for an increase in the quality and quantity of production.

Theory Is Simple One

The theory of color dynamics is a simple one. It involves the use of color to highlight, reveal and

Fig. 1—Over-all view of fine wire strand annealing dept. * * * * * * * *

Fig. 2—L. to r.: Raymond O. Hallberg, General Superintendent, and William J. Wind, Vice-President of Operations, going over color chart. Note spool of Tophet wire (company brand name) on corner of desk. * * * * *

emphasize. The transition is comparatively inexpensive, enabling a manufacturer to use color to bring out the best in the lights already installed in his plant.

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The first step is the separation of the critical from the non-critical parts of the machine. The critical parts are painted with a color designed as "focal." These focal colors are designed to focus the workers' attention precisely where it should be—to arrest his eye and reduce the unnecessary travel resulting when the entire machine is painted a dull gray.

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The second step, equally important, is relegating to the background the non-critical parts. This can easily be done with properly chosen colors. These non-critical parts must recede back. The most prevailing color is green, which is applied to the body of the machine. No other color has such a relaxing effect on the human eye as green. This is readily observed in the widespread use of green by nature in forest and field.

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While black still remains the standard color, other colors used are red, blue, yellow, light blue and marine blue. The main part of the machine unit is ordinarily painted green, with red for certain hot sections, green and blue for feeder lines and a bright yellow contrast to show up the accident-hazard spots.

"Elbow Grease," Then Paint

The practical application of paint to machines as carried out at the Driver plant is comparatively easy. First the surface is steam-cleaned or scraped to remove any blemishes or surface imperfections, the job being done by the maintenance department.

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A hand brush is generally used to apply the paint, with parts not to be painted carefully masked. Two or three coats are used. In many cases three coats are required, especially when a cream color is used over a black or a very dark color. A repaint job may be needed once a year, especially if the machine is subjected to severe service.

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To obtain maximum efficiency, it is desirable that the focal color used be in sharp contrast with the material being worked. For example, if the processed material is of steel or aluminum and the focal color is grey, the operator would be under constant eye strain to determine where the material ends and the machine begins. This unnecessary eye tension can be

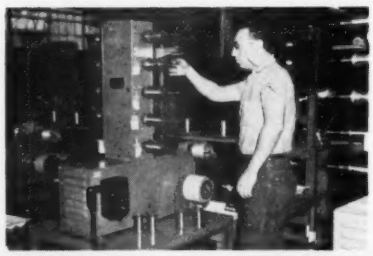

Fig. 3—Take-up operation in annealing room. Unit painted robin's egg blue. Bottom lines are bright yellow for safety and housekeeping purposes. * * * * * * * *

Fig. 4—Respooling dept., where spools are of blue plastic.

removed by using a focal color that gives a satisfactory contrast with both the stationary part of the machine and the material entering or coming out of it.

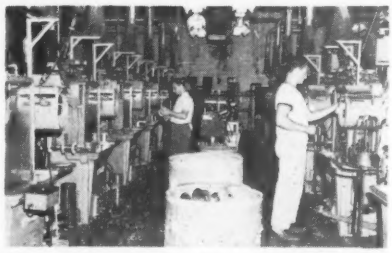

Fig. 5—Fine wire drawing section. High-speed wire-drawing machine where predominant color is blue and pulleys and guides red.

Color Application to Parts

For obtaining these desired effects, the color principles used at the Driver plant are as follows:

RED—small annealing furnaces; fire-fighting equipment; electric hot lines of 440 volts or over; and sprinklers. Hot lines carry red tags on each to signify danger from voltage.

GREEN—main body sections of the larger working units; water lines; water jackets and water tanks which are of acid-resistant green because of the fumes.

BLUE—gas lines; and all packing spools which are of blue plastic instead of metal to make for ready product identification.

YELLOW—compressed air lines, and a sharp shade of yellow for posts, cables and other hazardous spots.

ORANGE—hydrogen and natural gas lines.

NO COLOR—only for the steel oil lines because they are not hazardous.

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The full effects of color dynamics are carried out at this plant because it applies color to its entire environment—walls, ceilings, floors, various spool units—even to the company truck.

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This moving advertisement in fact was the firm's first venture into coloring so as to afford eye appeal. It has a chassis of royal blue, panel of chrome yellow with blue bottom, door sign in gold and identification lettering in red and white.

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When scientific coloring is used for total effect in room environment as well as for machine parts, the end result is to provide cheerfulness plus restfulness and good visibility.

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As a morale builder, interiors are brightened by colors that suggest sunlight. In uncomfortably hot environments, colors suggesting coolness are applied. On the other hand, warm shades are advisable where low temperatures are constantly encountered.

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Eye fatigue can be lessened by having eye-rest surfaces, such as surrounding walls, using approximately the same general tone of color (although not necessarily the same color) as the one the worker sees when he bends over his work.

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An outstanding example of the beneficial results attained by execution of these principles is provided in the completely enclosed and air-conditioned Inspection Department. Here the gray workbenches have green formica-equivalent tops with chrome edgings. The bridge part for checking electrical resistance is of chrome trimmings.

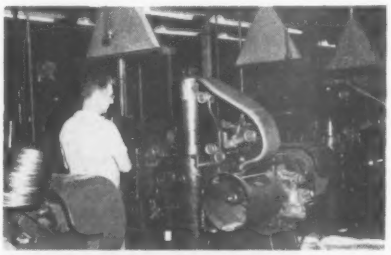

Fig. 6—Intermediate high speed continuous wire drawing. Royal blue body. Red coloring for guard, pulleys, take-up and take-off; finished die boxes, automatic clutch for spools.

Ceiling and walls are of corrugated glass with illumination coming through the top and helping to heighten the coloring effects. Flooring is of asphalt tile in diagonal strips of gray and black; walls are of buff with green wainscoating.

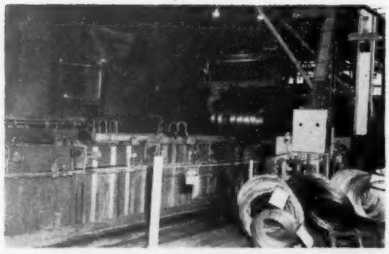

Fig. 7—Pickling Room in heavy wire drawing dept. Pickling vats are of green; post and cables are of sharp yellow contrast for safety purposes. Background walls of acid-resistant green because of fumes.

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As a result the inspection room has a restful look and is a pleasant place to work in, thus relieving boredom. Also helpful for this purpose is continuous playing of radio music.

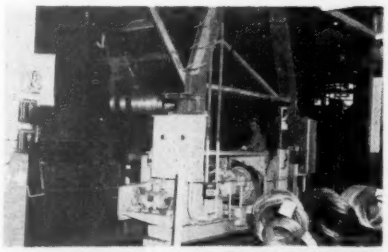

Fig. 8—Crane operation in Pickle House. Crane is of bright yellow to signify danger, with top portion of dark green to give contrast.

As a safety measure, posts and safety cables are marked in a bright yellow. Likewise, mobile equipment such as the moving crane are painted of bright yellow with the dark portion in green to provide the contrast, so that workers cannot fail to notice its approach. With such a wide application, the color reformation of the plant is complete.

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Color planning was instigated and worked out by **William J. Wind,** Vice-President of Opera-

(*Please turn to page* 1527)

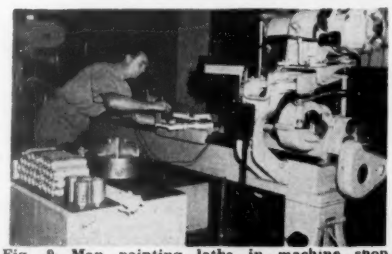

Fig. 9—Man painting lathe in machine shop. Unit is predominantly Brewster green.

Major Improvement in Wire Weaving Loom Disclosed by Screening Manufacturer

Constituting the first major advance in the weaving of insect wire screening since 1889, a battery of 40 new looms is now in operation at the **New York Wire Cloth Company's** plant in York, Pa. They are of radically different design from the conventional loom with shuttle and bobbin, which has been used to weave cloth since primitive times and was adapted in the late 1880's to the manufacture of insect wire screening.

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It is expected that the new looms will turn out around 50% more feet of screening per day than a loom of conventional type. President **Louis D. Root, Jr.,** spearheaded the team that developed this tremendous forward step in wire cloth weaving, making possible a product that is considered more uniform in quality than the company's present premium screening.

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The new method that has been perfected in this loom for feeding in the filler wire is chiefly responsible for the greatly improved uniformity of mesh and for the better appearance and quality of the finished screening.

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When Mr. Root succeeded his father as president of the Company in 1952, experiments looking toward the development of a better loom had been going on for many years. Altogether, it took eight years to develop a satisfactory pilot loom. Four test models were then built and tested under production conditions for two more years. Patents have been issued or are pending to cover all phases of the loom design. In addition, two trademark registrations have been secured on particular arrangements of the selvage edges.

The New York Wire Cloth Company has been weaving screening at the same location since 1889 and after nearly 70 years of weaving with looms substantially unchanged in principle, it has developed a new type of loom that may revolutionize the production of insect screening.
The article will also be found interesting insofar as it portrays the history of wire weaving and of the firm's growth.

Operating Principle

In the weaving of wire screening, the wires that run lengthwise are traditionally known as the warp. These run 18 to the inch and are so arranged that the warp divides into two parts through a set of two hettle bars, alternate strands going up with one bar and going down with the other to form a triangular lattice called the "shed." In the conventional loom, a bobbin or small spool of wire follows a shuttle through the shed and back again from the opposite side of the loom. The wire carried by the bobbin is known as the "fill" or filler wire. The fill is so spaced that there are 14 wires to the inch. Every square inch of screening therefore contains 252 tiny rectangles.

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In the new loom, the fill wire is fed into the warp through a hollow shaft. Mechanical fingers pull the wire across the loom at an exceedingly rapid rate. The fill wire is then cut to the proper length for the particular screen width, and the ends are tucked in the "selvage," the reinforced edges of the screening. Each end of fill wire thus serves to strengthen the selvage.

Production Advantages

1. The winding of bobbins is eliminated since the fill wire is fed from a large spool that comes directly from the wire drawing machine, already wound. Whereas bobbins have to be changed every eight to fifteen minutes on a conventional loom, the large spool will provide continuous feed for four or more hours, depending on the width of the screen cloth. For example, in weaving 30 inch screening the spool will supply wire for about 8 hours of continuous operation.

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2. The warp also is longer. The loom design makes it possible to provide a warp more than double the size used on conventional looms. This, again, enables longer continuous feed and operation.

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3. One of the principles that permits faster operation is the fact that the shed formed by the warp does not need to be opened as much as on the conventional loom since it is not necessary to pass a shuttle and bobbin through it. In addition, there is less wear and tear on moving parts, since the reciprocating mechanical fingers are light in weight compared with the shuttle arms.

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4. Noise level is reduced. Instead of the conventional clatter, the new loom operates almost silently. This is partly due to the elimination of the shuttle and bobbin and partly to a reduction of the movement of the loom's lay frame.

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5. Approximately one-third the number of sets of gears are needed to operate the entire machine as compared to the older looms.

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6. There is less rehandling of woven material. The roll of wire screening is not rewound for removal from the loom, an important quality point.

Early History

The drawing of metal wire is

Fig. 1—Some of the 40 new looms now in operation at the York, Pa., plant of the New York Wire Cloth Company. The new loom design constitutes the first major advance in the weaving of insect wire screening since 1889.

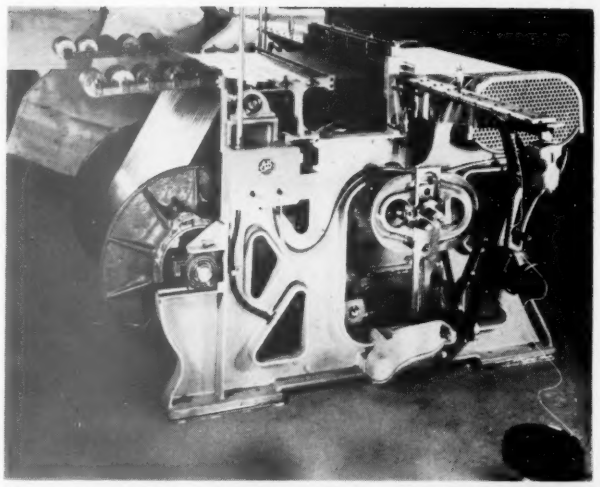

Fig. 2—Strands of wire from the warp drum are divided by the two hettle bars on the loom so they go alternately up and down. Fill wire is fed between the parts of the warp by mechanical fingers called stitch bars.

believed to originated in the Egyptian civilization of around 4000 B.C. In 3745 B.C. some gold wire was woven into a crown for a queen. The weaving of wire for the mundane purpose of insect control, however, did not occur until thousands of years later. The earliest known use of woven wire cloth to keep out insects was in 1666 A.D. at Nuremburg, Germany. Two centuries afterwards, insect wire screening was still a comparative novelty in the United States. A Matthew Brady photograph of the War Department building during the Civil War shows what appears to be screens installed over pivoted sash windows. Such insect-protected windows were distinctly out of the ordinary until two decades later.

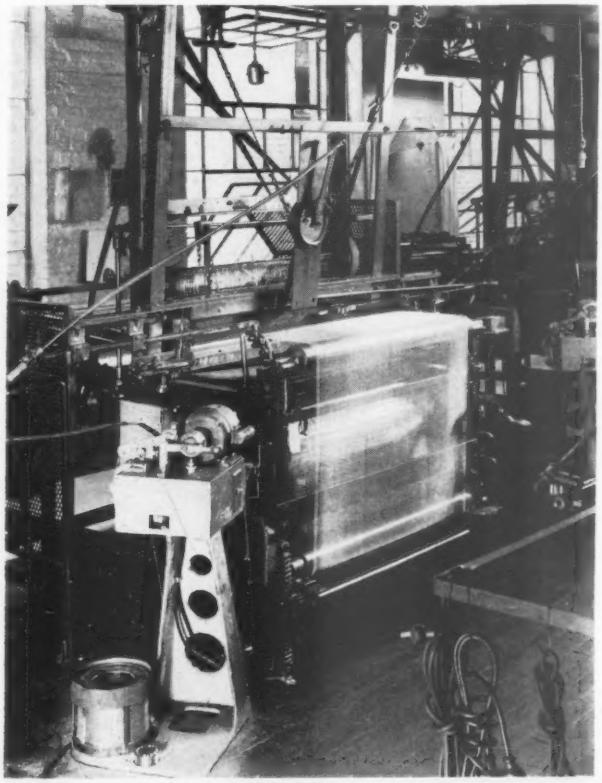

Fig. 3—In old method of weaving insect wire screening, small bobbins must be wound from the large spool of wire shown at bottom left. A bobbin is good for only eight to fifteen minutes of weaving; then loom must be stopped while a new bobbin is put in.

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In the 1880's, a firm known as the **Peerless Haircloth Company** was doing business at the site of the present weaving plant of the **New York Wire Cloth Company** in York. Peerless was weaving the hairs from horses' tails (imported from South America) into cloth to upholster the popular, but uncomfortable horsehair parlor sofas of the period. It was the era of the big "trusts." **John Eisenhart,** the proprietor of the York concern, sold out to the haircloth monopoly, dismantled his looms and pledged his word not to go back into the business of weaving horses' tails again.

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There was nothing in his agreement to prevent Eisenhart from weaving metal wire. He formed the **York Wire Cloth Company,** had looms built locally under the direction of out-of-town mechanics who knew something of this business and opened in the spring of 1889 at the old plant of the Peerless Haircloth Company. Three years went by. In 1892, Mr. Eisenhart's company became a part of the New York Wire Cloth Company, formed by the merger of the York plant with others located in Brooklyn, in Hamilton, N. Y., and in Homer,

N. Y. Since three of its four plants were in New York state, it is easy to see why the new concern was called by its present name. However, all of its plants but the one in York were abandoned during the first few years after the merger for one reason or another.

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During the formative years of the company, the Root family became owners of the business and, today, L. D. Root, Jr., president, represents the third generation.

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The company is one of the largest independent manufacturers of insect wire screening in the United States. Its wholly owned subsidiary, **Liberty Wire Company,** established in 1956 at Hato Rey, Puerto Rico, weaves screening for Latin America. In 1956, New York Wire Cloth diversified by acquiring the **Lofstrand Company,** Rockville, Maryland. Lofstrand manufactures a wide variety of metal products wholly unrelated to screening.

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The new looms are the latest of a series of developmental "firsts" by which the company has achieved its present status in the industry. The first "first" was a process to electro-galvanize steel screening after weaving, patented in 1911 by **Francis J. Root,** one of the company's founders.

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In 1933, the firm brought out the first successful aluminum wire screening. Aluminum has since become a serious contender with steel as the basic material for wire screening.

★ ★ ★

In 1936, it patented a process for producing multi-strand flat-wire selvage. This permitted the "marked - and - measured" edge, which has long been a distinctive feature of its insect screening. The footage that is marked along the edge of the roll eliminates reaching for a yardstick when a piece of specified length is to be cut.

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The company has also pioneered in plastic screening, and experiments with plastic and fiberglass yarns are constantly being made by the Research Department. Metal, however, continues to be the company's basic choice for screening.

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Except for the Lofstrand Division and the plant in Puerto Rico, the company's manufacturing operations are confined to York. Its three plants in the Pennsylvania city include a modern wire drawing mill, a weaving plant, and a fabricating plant for Durall tension screens and related products. Plans have been prepared and an option on a 60-acre tract of land taken west of York for a large modern plant that will consolidate all facilities except the wire mill.

Competition

Imitation is said to be the sincerest form of flattery, but in its younger days, the company felt that it could have done without so much of this particular form of admiration. The many screen cloth plants that sprang up in York County (possibly producing as much as two-thirds of the nation's entire output today) were largely the work of one indefatigable man. Nearly everywhere that **William F. Kintzing** trod, he left a screen plant behind him.

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During 1890 and 1891 Mr. Kintzing was employed as a machinist by John Eisenhart's York Wire Cloth Company. After he had learned everything he could about how looms were made and operated, he moved to the nearby community of Glen Rock and talked a machine shop there into opening up a wire cloth plant. This was only the beginning.

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A born promoter, Mr. Kintzing was never one to stay put for long. From Glen Rock, he moved to New Freedom, which started up a plant with 100 looms. In the course of his peregrinations, he was the mainspring behind four other York County wire cloth plants; two in Hanover, one in Mount Wolf and one in York. Eventually, he established his own machine shop and settled down to the building of looms, for which he became world-famous. There is no evidence, however, that he ever tried to sell a loom to New York Wire Cloth.

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That Bill Kintzing is the father of the modern insect wire screening industry cannot be denied. If he is so considered then New York Wire Cloth deserves to be called the mother, even though the marriage was scarcely a love match.

Changing Fashions in Screening

When horses roamed city and village streets, flies were the insects that most bothered householders. Mosquitoes passed almost unnoticed because flies were much the greater pest. The screening bought during the 1890's and early 1900's was considered satisfactory if it would keep flies out of the house. The early screening was woven 12 wires to the inch (square mesh) and painted green or black. It was cheap, and it did its job, so far as flies were concerned. But as flies declined, people began to notice the mosquitoes and other small insects that were infiltrating through the meshes. A demand began to grow for finer-mesh screening.

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Screening came down to 16 by 16 mesh. This kept out mosquitoes, but introduced a production problem. It was impracticable to paint the fine-mesh screening, as the 12 x 12 mesh had been painted to protect its steel wires against rust. Something else had to be done.

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Three solutions were found. The first answer was the electro-galvanizing process, earlier mentioned. This gives the steel wires a rust-proof zinc coating. Another solution, satisfactory but more expensive, was the production of bronze screening. Bronze has an inherent resistance to corrosion from weathering, even to seashore corrosion. The third answer was the development of aluminum

(*Please turn to page* 1525)

A New High Speed Continuous Take-Up And Pay-Off System for Wires

by H. Otto Haugwitz, Engineer
Attaché to the General Manager
Geoffroy - Delore
Paris, France

The article describes a new method of utilizing drums as containers of wire and new mechanisms for taking up and dispensing bare and insulated wire that permit of high speeds and continuous operation.

In order to make possible the handling, storing and dispensing of wire, it has to be wound up.

* * *

Until recently, the winding of the wire had been made in form of coils, in which the windings have to be tied for the handling, or wound on reels.

* * *

Each of these units contains a limited length of wire and the latter has to be cut at the reception, if the unit is changed.

* * *

Whilst only machines were used with speeds not exceeding about 200 m (650 ft.) per minute, which could stop and start without disturbing the function, for instance, wire drawing machines without continuous annealers and longitudinal process machines for rubber insulated wires. All these take-up methods gave satisfaction and the changing of units was not a problem.

* * *

But with the greatly increasing speeds of today this is no longer the case and modern manufacturing methods also demand in a greater measure continuous running.

* * *

In wire drawing machines with continuous annealers, when starting, the first end of the wire is not annealed, because the current, which heats the wire, is only flowing when the machine has reached its full speed and, because this current has been cut before the machine has stopped completely, this end is also not annealed and therefore not useful.

In extruding machines for plastics and, especially in extruding machines with continuous vulcanization, lengths also are lost at each stop and the longer the lengths the faster one runs, as in the wire drawing machines.

* * *

These stops lower not only efficiency, they create also losses of raw material and labour due to the inevitable waste and the repeated threading of the wire into the machine at each stop.

* * *

On the one hand, continuous annealing in wire drawing machines is being utilized more and more and the old longitudinal process machines for rubber insulating are being replaced by extruders that do not demand expensive calanders occupying much floor space; on the other hand, wire drawing machines run nowadays with speeds of about 1500 m (5000 ft.) per minute and with the extrusion of plastics on wires speeds of about 600 m (2000 ft.) per minute are obtained.

* * *

This fact creates a need for a method that permits those speeds at the take-up and also at the pay-off stand and permits the wire to pass without difficulty from one unit to the other without stopping nor slowing down, i.e., continuous running.

* * *

It is only possible to coil wire at low speeds, or with a dead head coiler, in which the coil does not rotate, but the speed of the devices up to the present are not very high and do not exceed 300 m (1000 ft.) per minute; they are therefore not suited to the faster machines.

* * *

The continuous pay-off of coils is possible in principle, when the wire is pulled in the direction of the axis of the coil, because the two ends of two successive lengths are accessible and can be welded before, but at speeds of over 200 m (650 ft.) per minute entanglements of the wire occur. This method is therefore not useful for higher speeds.

* * *

For continuous take-up on reels a certain number of double spoolers have been constructed in which the passage of the wire from one reel to the other one is automatic and which cuts the wire between the reels and leaves the inner end of the wire accessible.

* * *

These devices occupy considerable floor space and are rather complicated and expensive. The inner end of the wire is moreover very short, which makes the welding of the following length difficult.

* * *

For the dispensing of wire from reels at high speed, the only way is, as in the case of coils, to pull the wire in the direction of the axis of the reel. This method has been utilized with pick-ups. The inertia of this device creates difficulties at speed variations and it can not be used for very high speeds. An automatic passage

from one reel to the second one is nearly impossible with it.

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The rough rim of the reel flange has therefore to be protected by a polished ring, that can also rotate freely or be driven by a motor in the direction of the winding off wire; the wire alone has to be pulled without any guides. A cylindrical and conical protection outside is however indispensable to avoid the ballooning of the wire.

★ ★ ★

If two reels are placed close side by side so that their axes form a small angle, the ends of the wires have been welded before and an anti-ballooning protection covers the two reels, the automatic passage of the wire from one reel to the other one is possible at full speed. Those pay-off stands are already in use, but the changing and putting in position of the reels demands special devices.

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An inevitable inconvenience of reels is that it happens sometimes that windings are pinched between other windings. The wire can not pay off freely and breaks.

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In USA a new method has been introduced in an increasing measure recently, the principle of which was already known, but applied only in a few special cases: The take-up of wire in drums,* which has a certain number of advantages.

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This method, which had been developed especially for the expedition and the shipping of bare wires, utilizes generally cylindrical fibre drums with an inner cylinder of a smaller diameter fixed in the center.

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The wire, the windings of which have a constant diameter, corresponding to the median diameter of the two cylinders, is wound in the space between the two coaxial cylinders and each winding is displaced relative to the others, so that they fill the space between the cylinders like a honeycomb.

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The drum, or pay-off pack, is rotating when receiving the wire and the latter, coming from a rotating haulage capstan, is pushed through a guiding tube and enters into the rotating drum.

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The equilibration of a cask filled with wire is very bad, a fact that limits the rotation speed, so that the haulage speed of the wire cannot much exceed 300 m (1000 ft.) per minute.

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This take-up device is in principle much more simple than a spooler, because the traverse has been eliminated, but the rotating drum does not permit either a changing of the drums or the pulling out of both ends whilst running; the method in this form is, in spite of its incontestable advantages, not useful for continuous running.

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To answer to the demands of high speed on one side and a continuous operation on the other, without interruption nor slowing down in the take-up and the pay-off device, is described in the following paragraphs.

New System of Take-Up in Drums

Such a system has been developed and introduced in the workshops of Geoffroy-Delore, Paris.

★ ★ ★

The new tape-up device contains, contrary to the American one, a non-rotating capstan on which the wire is wound by suitable guides. Its adherence is ensured by special devices.

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The windings fall freely and without rotation into the drum, which is also immobile and placed under and in the axis of the take-up head, which has in principle the same form as the drum already in use.

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Because this system was supposed to be used primarily for in-plant use, and because one would obtain long life, metallic drums have been chosen. These have two opposite rows of holes, permitting the observation of the filling and the dispensing and to control eventually the look and diameter of the wire.

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Between the haulage device and the drum is fixed a cylindrical device, which can be closed on the lower side. If it is closed by means of a lever, the windings remain in this part. It is called an accumulator. The full drum underneath can now be changed with an empty one without any variation of speed and the whole operation can be done quietly.

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Two drums are placed on two pivoting forks, which are locked automatically in the working position. A special device ensures the centering of the drum.

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If one wants to change the drum after having closed the accumulator, the forks are unlocked by means of a pedal and they are swivelled 180 degrees.

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Then the accumulator is opened and the pack of windings accumulated meanwhile falls into the empty drum. The wire has not yet cut between the drums. The inner end is therefore pressed against the outer wall of the drum.

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It is now easy to fasten the end with a sufficient length outside of the drum to make possible and easy the welding of two successive lengths and a continuous supply from the manufacturing machines.

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To make easy the handling inside the workshops, the drums, contrary to the American system, are provided with two feet and a special hand-barrow has been developed, permitting the transport of the drums and putting them into the forks of the cask-changing device (Fig. 1). The transport of the drums by means of trucks pro-

* "Wire and Wire Products," March 1954, page 273; "A New Process for Wire Drawing. Packaging. Handling and Dispensing" and "Wire and Wire Products," December 1954, page 1430: William H. Richardson, "Continuous Wire Drawing and Packaging."

Fig. 1

vided with forks is also possible. The drums can be stacked.

Fig. 2

In the cableworks of Geoffroy-Delore we began to equip the tinning installation for medium and big wires (0.4 to 3.5 mm) with drum take-ups. Figure 2 shows a take-up for wires of 0.4 mm up to 1.6 mm (No. 26 up to 14) in diameter, the speed range of which is from 120 to 600 m (400 to 2000 ft.) per minute. For bigger wires 8 take-up heads had been united in a battery (Fig. 3). They run generally at 75 m (250 ft.) per minute, exceptionally at 150 m (500 ft.) per minute. The accumulator had been eliminated, because at this low speed the windings can be held by hand if the drum is changed.

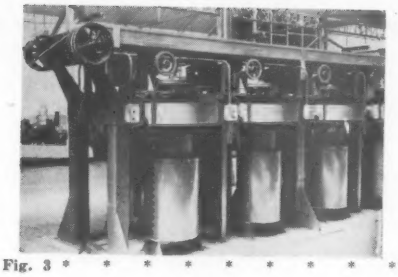

Fig. 3

When after a prolonged service the advantages of this system of using the drums had been confirmed in a very clear manner, the equipment with drum take-ups of the whole wire drawing department, the fine wire machines excepted, was decided upon. The machines in question were old drawing machines without continuous annealers, running at speeds of about 400 m (1300 ft.) per minute and modern Syncro machines with continuous annealers, D-13, D-14 and C-12, with speeds up to 1500 m (5000 ft.) per minute.

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For these high speeds it was necessary to create another reinforced model, because all pieces are more charged and the matter of equilibration demands special measures. Figure 4 shows a Syncro machine with its take-up. The automatic double spooler which was previously utilized could have been dismounted and floor space won.

Fig. 4

A diameter of 0.4 mm (No. 26) represents the lower limit; the upper one is 3.3 mm (No. 8) for the standard type of take-up.

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The average weight of bare copper wire per drum is about 200 kg (440 lbs.), but it may be quite different from this figure, depending on the diameter and the speed of the wire and whether it is hard or annealed.

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When the wire is stocked in metallic drums the capital invested in the drums is only half that of reels of the same capacity, which are relatively expensive in cases where reels for wire drawing machines are used, because those must be turned and equilibrated with high precision. With fibre drums the comparison would be still more favorable.

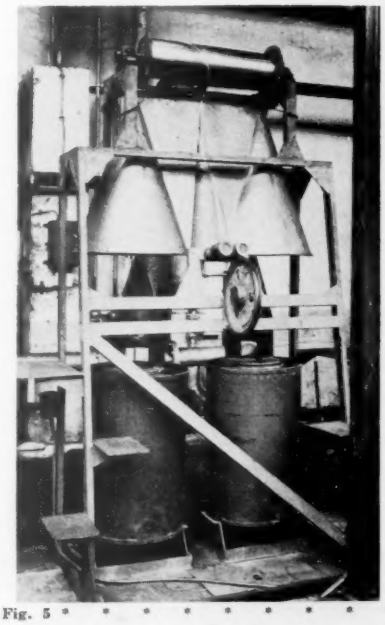

Fig. 5

For the continuous supply to extruding machines for rubber and plastics with bare or tinned wires, a supply stand for two drums is used (Fig. 5). The central cylinder of the drum is prolonged above and bears a ring that can rotate, or prolongement in the form of an arrowhead is utilized (Fig. 6), which avoids the formation of knots that wire has the tendency to make. For high speeds the drum is prolonged also

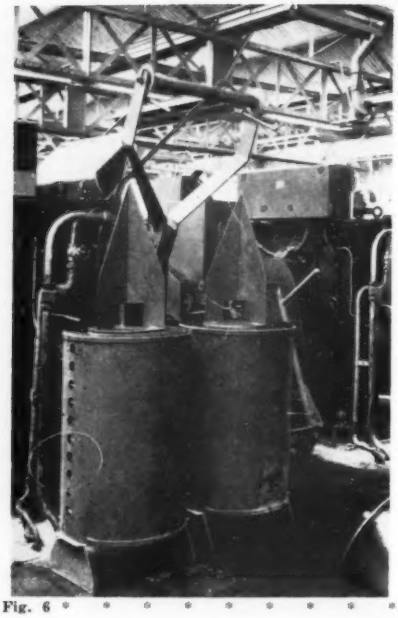

Fig. 6

outside with cylinders to avoid the ballooning of the wire due to centrifugal force.

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Above the drums is fastened a double metallic cone with a slot on top. Above the slot is placed a roll. For slow speeds the double cone is not necessary. (Fig. 6).

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The lower end of the first drum is welded together with the upper end of the second one and the wire is placed so that it passes in a straight line from one drum to the other.

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The wire can now be pulled from the drum at a very high speed under the only condition that each winding had been displaced sufficiently against the preceding one in the space between the two cylinders of the drum, to avoid the wire getting under a preceding winding and create an entanglement. This displacement is ensured by a special distributing device in the take-up head, but if the drum is shaken by rough handling, the wire must be compressed in the drum to keep the windings from moving. This can be done by a cover in form of a ring with springs underneath.

★ ★ ★

The fact that only the wire itself is in movement and there is no inertia, allows starting with an unlimited acceleration and also stopping abruptly without damage to the winding or the wire.

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When the first drum is empty the wire passes to the other one automatically and whilst the second one is emptying there is time enough to change the empty drum with a full one and to make a butt weld.

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A continuous supply of bare wire makes possible a considerable improvement in the coefficient of efficiency of the extruders.

★ ★ ★

For the high speeds required today in extruders, the drum offers uncontested advantages for the continuous take-up of insulated wires. But the outer diameter of these wires is limited by the dimensions of the drums, because otherwise the length per cask becomes too small, the coefficient of filling is naturally smaller than that of reels of the same capacity. Figure 7 shows the length per drum for different wire diameters.

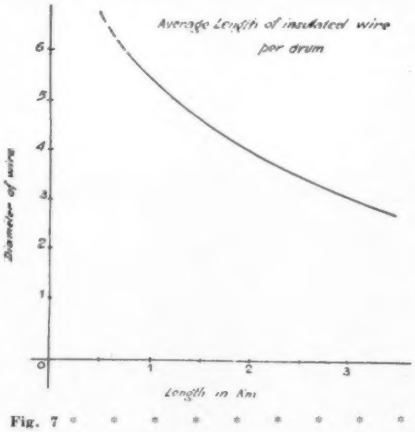

Fig. 7

Extruding machines for plastics have already been equipped with drum take-ups for diameters up to 6.5 mm (1/4 inch.). With these machines, but for smaller diameters, extruding speeds up to 600 m (2000 ft.) per minute have been obtained.

★ ★ ★

Figures 8 and 9 show an installation in which an extruding machine with a screw diameter of 120 mm (4¾ in.) equipped with a drum take-up supplies the coiler seen in the background. In this manufacturing chain the wire is no longer cut between the different drums, it forms for a consecutive number of drums one continuous length. The economic advantage from the elimination of all waste by faulty cutting is considerable.

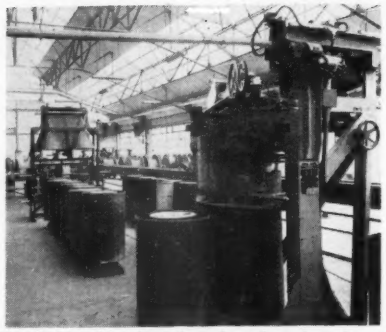

Fig. 8

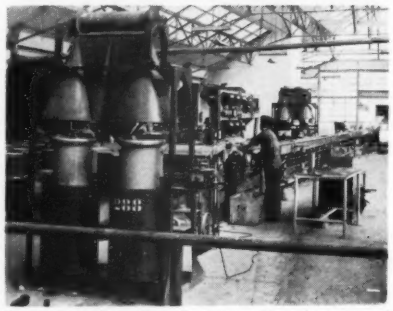

Fig. 9

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A drum take-up represents at the same time a handling device and a double take-up. When comparing the original cost of such equipment with equivalent reel equipment, this fact must not be overlooked.

★ ★ ★

The slipping device, always necessary between a take-up reel and the hauling device in an ordinary take-up does not exist in a drum take-up.

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This and the absence of an alternating traverse movement makes the drum take-up more simple.

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Because generally there is only one type of drum used, the take-up

(*Please turn to page* 1527)

Practical Slide Rule Method for Calculating Percentage Reduction in Area in Working and Testing of Rod and Wire

by Dr. F. A. Mohrnheim
Associate Research Professor of Metallurgy
Engineering Experiment Station
University of Rhode Island
Kingston, Rhode Island

Prof. F. A. Mohrnheim

A simple slide rule method is described for determining percentage reduction in area when rod and wire are reduced in diameter by drawing. Pencil and pad are not needed. The minimum number of passes, sequence of die sizes and other mathematical wire mill problems, may be determined rapidly by this method.

The author was appointed to his present position on September 1, 1957. His previous practical experience as a metallurgist in non-ferrous metals was acquired in Pforzheim, Germany, Toronto, Canada, and Attleboro, Mass. He holds a degree of Doctor in Engineering from Stuttgart, received in 1942, and was registered as a Professional Engineer in the Province of Ontario in 1954.

In drawing, rolling, and swaging operations the micrometer is conventionally used to measure the diameter of rounds before and after the reduction of the metal. The difference in the diameter itself, however, does not provide a proper measure of the degree of reduction. The percentage reduction in area, the only significant value, must be calculated as the difference between the original cross sectional area and that of the smaller area, stated as a percentage of the original area. This involves the use of log tables, a calculating machine or, more conveniently, a slide rule.

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In tensile testing, the "Percentage Reduction in Area at Fracture" is determined as a physical property of the metal, and is most serviceable and practical if interpreted intelligently. It can be used, typically, when the following are required:

(a) Anticipating necessary anneals.
(b) Obtaining specified hardness.
(c) Maximizing drawing procedures and minimizing anneals.
(d) Selecting optimal die sequences.

★ ★ ★

The writer of this article has worked in various medium-sized metal drawing departments in different countries and found that only a minority of responsible persons are closely enough acquainted with the intrinsic worth of the expression "Percentage Reduction in Area" to benefit consistently when its use is suggested. Sometimes there is a lack of understanding of the phrase, but more often the fear of complicated and time-consuming calculation is responsible for the costly trial and error approach, with the result that wire may be overdrawn to fracture, or not drawn enough, leaving it at a critical strain, so that undesirable large grain growth will develop during subsequent heating. There has seemed to be a need for a fast and simple method to calculate the percentage reduction in area right at the work bench whenever diameters are measured or considered.

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It should be mentioned that this need has been well recognized and that special devices have been invented to supply quick answers to these problems, e.g., E. Jefferson Crum [1] has devised a series of charts for the calculation of wire die sizes needed for a series of reductions. These were later embodied in a circular drafting calculator and were originally described in **Wire and Wire Products,** March, 1946 [2]. This calculator is very useful when you have it and when you have learned how to obtain the desired information from it. However, many metallurgists or foremen of wire departments do not possess this special calculator, yet they may own an ordinary slide rule.

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Applying a logical sequence of steps to an ordinary slide rule, the writer found that, without remembering or recording intermediate results, the answers to many problems can be read directly from it. Following is a list of seven such problems:

1. **The percentage reduction in area.**
2. **Duplicating percentage reduction in area.**
3. **Minimum number of passes and die sequences.**
4. **Largest starting diameter for a given end size.**
5. **The percentage draft per hole in equi-drafting.**
6. **Slippage.**
7. **Diameters of step-cone drawing blocks.**

This method will prove beneficial to operators or foremen who can master the simple slide rule. It will also be useful to mechanical metallurgists involved in the improvement of metal working, and to process metallurgists endeavoring to accelerate pilot processes, special orders or quality control. It is quite possible that this slide rule method is known and used by others, but the writer has uncovered no evidence to that effect.

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A common slide rule with scale A above scale D on the body is used, scales B and C being on the slide. If scales B and C are on the back of the slide rule, the steps in the method remain the same except that the slide rule must be turned over to read corresponding values.

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The basic sequence of steps in the method is:

Push hairline to smaller diameter on D;
draw larger diameter on C under the hairline;
opposite index of B read value on A; subtract value from 1.

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This difference between the reading on A and 1 is the desired percentage reduction in area. With a little practice the percentage reduction in area can be read on A without the mental subtraction, by counting the marks of scale A from the right and associating the supplementary numbers.

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The following is an explanation of the method: We express the area after the reduction of the metal as a percentage of the starting area:

% Area After Reduction $= (d_2/d_1)^2$ **(Eq. 1)**

where d_1 is the larger, starting diameter (on scale C), and d_2 is the smaller, reduced diameter (on scale D). This percentage Area After-Reduction (expressed as a decimal) plus the percentage Reduction in Area (expressed as a decimal) equals the Starting Area taken as a unit, or, rearranging terms:

% Reduction in Area $= 1 - (d_2/d_1)^2$ **(Eq. 2)**

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Scale A of a slide rule shows the squared numbers of scale D. Using the lower scales for dividing the smaller diameter into the larger one and reading above, opposite index B on A the value $(d_2/d_1)^2$ i.e. the percentage Area After-Reduction, is found. The unknown percentage Reduction in Area is then simply the difference between 1 and $(d_2/d_1)^2$.

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The following examples demonstrate the solution of most frequently encountered problems in tensile testing, and rod and wire reductions:

I. Percentage Reduction in Area

Example 1. A standard round tension test specimen, 0.5 in. dia., when broken measures .418 in. dia. What is the percentage reduction in area at fracture?

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Solution.

Push hairline to 418 on D;
draw 500 of C under the hairline;
opposite index of B read 700 on A;
subtract .70 from 1.

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Answer. The reduction in area at fracture is 30 percent.

II. Duplicating Percentage Reduction in Area

The reversed procedure will obviously supply the answers to problems where the end diameter and the percentage reduction in area are given, and where the diameter from which the round has to be reduced is unknown. This type of problem frequently arises when the percentage reduction in area of a specified wire is to be duplicated at another diameter for reasons of obtaining the same or similar grain size, hardness, or ultimate strength.

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Example 2. From what stock size should .070 in. dia. wire be drawn to duplicate the strength of a different sized sample which has had 36 per cent reduction in area?

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Solution.

Subtract .36 from 1;
set index of B opposite 64 on A right;
opposite 70 of D read 875 on C.

Answer. In order to duplicate the 36 per cent reduction in area for the given end size, the starting diameter of the wire must measure .0875 in. dia.

III. Minimum Number of Passes and Die Sequences

For rolling with multiple wire rolling mills or for swaging of rods the minimum number of rolls or dies, respectively, is determined by the maximum percentage reduction in area which is not to be exceeded.

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Example 3. What is the minimum number of grooves or dies required in reducing rounds from .210 in. dia. to .115 in. dia. if 22 per cent per pass is not to be exceeded?

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Solution.

Subtract .22 from 1;
set right index of B opposite 78 on A right;
opposite 210 of C read 185 on D, (Step 1);
opposite 185 of C read 164 on D, (Step 2);
opposite 164 of C read 145 on D, (Step 3);
opposite 145 of C read 128 on D, (Step 4);
opposite 128 of C read 113 on D, (Step 5).

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Without changing the position of the slide, read in a continuous series the subsequently smaller diameters on scale D opposite the preceding larger diameters on scale C. The hairline on the glass runner or indicator may be pushed to the left to opposite positions for the ease of reading. Answer: Five grooves or dies respectively are necessary to reduce the round, namely, .185, .164, .145, .128, and .115 in. dia. (at the last step only 18 per cent reduction in area is needed to arrive at the required end size).

IV. Largest Starting Diameter for a Given End Size

A procedure similar to Example 3 is necessary for the determination of the largest possible stock size for a continuous wire drawing machine geared for a certain num-

ber of equal percentage reductions in area in order to arrive at a given end size.

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Multiple die wire drawing equipment for many non-ferrous metals in the United States of America is generally geared to take Brown & Sharpe gauge reducing system steps that involve a 20.8 per cent reduction per hole. Under normal working conditions any over or under drafting in relation to the B&S gauge system is usually done at the first die. Such procedure, as is obvious, minimizes slippage of the wire on the blocks. (Slippage arises when wire increases its length faster than the block rotates.)

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To find the proper dies and the largest possible starting diameter of the stock the reversed procedure of Example 3 is used:

Depart from the finishing die;
find the preceding dies that are 1 B&S step larger;
from first die find starting diameter of stock.

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The reduction by the first hole (Step 1) can be over or under 20.8 per cent; but, in order to avoid failure one must make sure that it does not exceed the permissible maximum.

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Example 4. A six block continuous machine, geared to take B&S gauge reducing system steps, is to draw wire to .102 in. dia. and the maximum permissible reduction in area is 30 per cent.

a) What are the die sizes?
b) What is the largest possible stock size?

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Solution 4a.

Subtract .208 from 1;
set index of B opposite 792 on A right;
opposite 102 of D read 114 on C, (Step 6);
opposite 114 of D read 129 on C, (Step 5);
opposite 129 of D read 144 on C, (Step 4);
opposite 144 of D read 162 on C, (Step 3);
opposite 162 of D read 182 on C, (Step 2).

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Answer 4a. The dies are .182, .162, .144, .129, .114, and .102 in. dia.

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Solution 4b.

Subtract .30 from 1;
set index of B opposite 70 on A right;
opposite 182 of D read 217 on C, (Step 1).

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Answer 4b. The largest possible stock size is .217 in. dia.

V. Percentage Draft per Hole in Equi-Drafting

Another wire drafting problem often arises where a given total percentage reduction in area is to be divided into a certain number of subsequent equal reduction steps. Possible ways to find the solution are shown in the following Examples 5a and 5b.

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The mathematical method for determining the solution uses Equation 2 adopted to the number of n steps. The total percentage Area After-Reduction analogously can be replaced by the difference between 1 and the percentage Draft per Hole to the nth power.

$$\text{"T.P.R.A."} = 1 - (d_n/d_1)^n$$
$$= 1 - (1 - \text{"P.D.H."})^n \quad \text{(Eq. 3)}$$

where

n is the number of holes;
d_n is the diameter of hole n;
d_1 is the starting diameter;
"T.P.R.A." is the Total Percentage Reduction in Area;
"P.D.H." is Percentage Draft per Hole.

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From Equation 3 it follows that:

$$\text{"P.D.H."} = 1 - \sqrt[n]{1 - \text{"T.P.R.A."}} \quad \text{(Eq. 4)}$$

★ ★ ★

To find the "P.D.H.," obviously, one has to find the root corresponding to the given number of reduction steps of the difference between 1 and "T.P.R.A."

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Example 5a. What is the "P.D.H." if "T.P.R.A." is 88 per cent, the number of holes being six?

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Solution 5a. Subtract .88 from 1;

find $\sqrt[6]{0.12}$

subtract value of root from 1.

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To calculate $\sqrt[6]{0.12}$ is not too difficult a problem with the slide rule when one knows the use of logs (e.g., 1/6 log 0.12 = 1/6 (9.08 —10) = 1/6 of 59.08-60 = 9.845—10).

$$\text{"P.D.H."} = 1 - \sqrt[6]{0.12} = 1\text{-}0.70 = 0.30 = 30 \text{ per cent.}$$

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Answer 5a. 30 per cent draft per hole by six dies reduces the stock 88 per cent.

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A second possible and easier way to find the "P.D.H." does not require us to find a higher root nor to have any particular knowledge of logs. Knowing the starting and end diameters of the "T.P.R.A." the solution of the problem is found by assuming an approximate answer and checking whether this assumed value of "P.D.H." fits into the "T.P.R.A.," following the method shown in Example 3. If the assumed value of "P.D.H." is found to be too large or too small, another trial with a smaller or larger "P.D.H.," as the case may be, is undertaken. Often the third trial will supply a good approximation, close to the theoretical value of "P.D.H."

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Example 5b. What is the "P.D.H." for six holes to draft wire from .090 in. dia. to .031 in. dia.?

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Solution 5b. Our first assumption for a possible solution is 25 per cent. The series of subsequent dies found by following the method of Example 3 is then: .0779, .0675, .0585, .0506, .0438, and .0380. This shows that 25 per cent reduction in area in six subsequent steps would not reduce the wire sufficiently to bring it down to .031 in. dia. Therefore, a corrected higher "P.D.H." is tentatively assumed, e.g., 28 per cent. The new series reads: .0764, .0648, .0550, .0467, .0396, and .0336. The second

(*Please turn to page* 1522)

Government Wire Production Information

GSA Revises Aluminum Contracts

General Services Administration has reached agreement with three primary aluminum producers on revision of the aluminum supply contracts which were entered into during 1950-51-52 to meet urgent long-term requirements for aluminum which emerged during the Korean War.

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The signing of the agreements, announced today by **Franklin G. Floete,** Administrator of General Services, revises contracts with **Aluminum Company of America, Kaiser Aluminum and Chemical Corporation** and **Reynolds Metals Co.**

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"The revised contracts," Mr. Floete said, "are the result of extended negotiations with the companies which have been helpful in cooperating with the Government. Also, the interest expressed by the Joint Committee on Defense Production was very helpful. The amendments are within the framework of a recent ruling by the General Accounting Office interpreting the put rights under the contracts."

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Under the original contracts, the companies undertook to enlarge their productive capacity by 658,475 short tons of aluminum per year. The contracts gave the companies the right to tender to the Government the production from the contract facilities in excess of the requirements of the producers for a five-year term.

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The contracts have now been modified on the following major points covered by the negotiations:

1. **Producers have agreed to limit their put rights by deducting from production the full amount of primary aluminum purchased from other sources.**
2. **Producers have agreed that metal delivered to the Government shall be stockpile grade rather than meeting the previous lower minimum grade of 99.0 percent purity.**
3. **Producers have agreed to sell the aluminum to the Government at the price prevailing at the time it is produced rather than at the time it is shipped.**
4. **The contracts formerly had specified that 25 percent of the expanded capacity be earmarked for nonintegrated users for a period of 15 years after expiration of the put rights. Now the amount to be made so available to such users is 35 percent of such capacity, an increase of 40 percent. This will make a total of 230,466 short tons a year available to independent fabricators and extruders, or a 15-year total of 3,456,990 tons worth nearly $1.8 billion at today's market price of 26 cents a pound.**

GSA To Sell Cuban Nickel Plant

General Services Administration announced that it has secured approval for the disposal to private industry of the Government-owned

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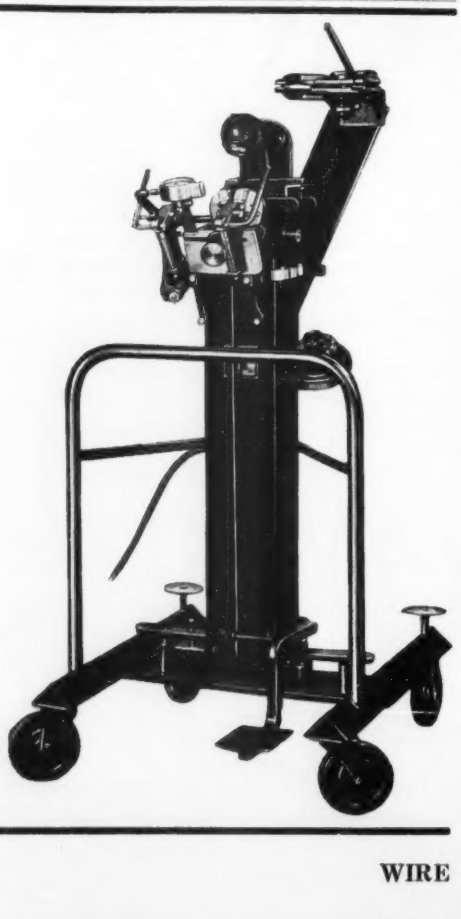
Standard equipment with these units include annealing dies, filing vise, light extension cord, and mounting on a 4-wheel truck. Special units can be furnished for crane mounting.



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nickel plant at Nicaro, Cuba, which represents a net investment by the Government of $85,000,000 and now constitutes the second largest nickel producing operation in the free world.

★ ★ ★

The Nicaro plant was originally built during World War II with funds provided by RFC. It was designed to utilize a process developed for extracting nickel from the vast deposits of nickel bearing ores in Cuba. The plant was operated for the Government's account for 40 months until operations were suspended in 1947. In December 1949 the plant was placed in the National Industrial Reserve. It was later reactivated and full operation to produce nickel for defense purposes was resumed in July 1952. Since that time, it has been operated under a management agreement for the account of the Government. Because of the accelerated demand for nickel which continued to develop after the Korean crisis, the capacity of the Nicaro plant was expanded from about 30,000,000 pounds of nickel to its present capacity of 50,000,000 pounds annually. The expansion was completed in March 1957, and the plant is now fully operative on a profitable basis.

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Until the middle of 1956, a substantial portion of the nickel produced was placed in the national stockpile. Since May 1956, all of its production has been diverted to industry at non-premium prices.

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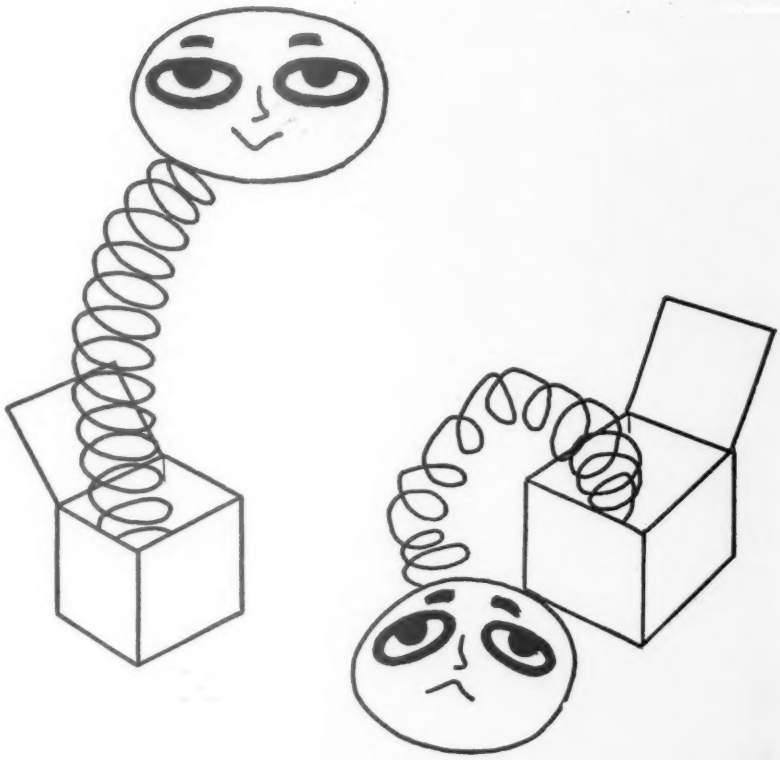
Title to the Nicaro nickel plant, including certain related ore bodies, is vested in Cuban Nickel Company, a Cuban corporation, all of whose stock is owned by the United States Government. It is the only plant now in commercial operation for the production of nickel from Cuban nickeliferous ores. Its operations have demonstrated the technical and economic feasibility of processing those ores. The plant produces a superior grade of nickel oxide in the form of powder and sinter. Since 1956, a portion of the nickel oxide has been converted into metallic nickel



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at a privately-owned plant at Crum Lynne, Pennsylvania. A pilot plant is being constructed at Nicaro to test processes and operating methods.

★ ★ ★

The disposal terms, whether under a lease or sale arrangement, will include appropriate provisions to secure to the United States any part of the productive capacity of the plant that is needed for defense purposes so that the Nicaro plant may be preserved as a part of the mobilization base for purposes of national security.

Washington Report
by Larston D. Farrar
Washington, D. C.

The period between now and January 7th, when the second session, 85th Congress, comes into session, is a good time to "see your Congressman," if something is pressing on your mind that you feel he should know.

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Although a lot of Representatives and Senators have been vacationing, odds are great that you could get a personal interview with them before Congress reconvenes.

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As of now, the "big" legislative projects for '58 being talked in Congressional circles are these:

1—**Definite tax relief for small businessmen, including corporations that earn $100,000 a year and under.**

2—**Extension of the minimum wage legislation to workers not now covered and, perhaps, raising of the minimum wage to $1.25-an-hour.**

3—**Revision of social security legislation so as to raise the payments about 10 per cent to retired people, plus raising of the individual base from $4,200 to $6,000 (the amount on which SS taxes are levied).**

4—**Revision and elimination of excise taxes, (except those on tobacco and alcoholic beverages), in order to eliminate business inequities that have grown up through World War II excises.**

5—**Increase of the personal income tax exemption to $750 a year, per person, in place of the $600-per-year, now allowed. This would benefit all individual taxpayers and would eliminate from direct federal taxes millions of families now paying only very small sums, but who make returns.**

6—Passage of legislation to extend the lending authority of the Small Business Administration, to make it permanent, and for other SBA changes, as was embodied in the House-passed bill in the first session.

Because '58 is an election year, most Congressmen already are convinced that they can't let another session slide by without passing concrete legislation to alleviate the difficulties of some groups who have been showing—as in the special Wisconsin election — that, although silent, they are upset about lack of action to help them.

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The SBA is making loans now at a rate some 50 per cent above that of a year ago; the trend is upward, due to the continued squeeze on credit by the Federal Reserve Board. SBA now is receiving loan requests at a record rate, but, of course, it can take care of only a small percentage of the total number of applications.

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There were wide variations in the growth patterns of manufacturing industries during the 1947-54 period, according to the first in a series of "growth industries" reports being issued by the Office of Area Development, U.S. Department of Commerce.

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Although manufacturing employment as a whole grew by 7.6 per cent, 13 of the major industry groups in manufacturing (excluding ordnance) reported increases ranging up to 45 per cent (in transportation equipment), while the other seven groups registered declines, one as much as 16 per cent (textile mill products).

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Even greater variation existed among the 445 individual industries for which Census data were published. More than one-half the industries reported a drop in their employment totals; in contrast, one-fourth (106) showed gains of 20 per cent or more. Of these, 23 industries reported impressive increases of 50 to 100 per cent, while 18 others more than doubled their work force during the seven-year span.

★ ★ ★

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Assured supply from a reliable domestic source . . . always available in economical and convenient packaging.

Proved performance as components of cables and wires that meet government specifications . . . stability shown by trouble-free installations in continuous service 20 years and longer.

FREE — SAMPLE SPOOLS of any type of Textilene filler to demonstrate the superiority of Twitchell materials in your operation—also technical counsel without cost or obligation. Just tell Twitchell your end-use requirements. *Write, wire, or phone today:*

E.W. TWITCHELL INC.

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PAPER PRODUCTS FOR THE WIRE INDUSTRY

Twisted • Folded • Pressed • Crushed • Shaped • Braided • Woven

EFFICIENT, MODERN SYSTEMS

FOR

ELECTRICAL WIRE & CABLE MANUFACTURING

• *CABLE LACQUERING SYSTEMS*

Conventional cellulosic, or other type, lacquers are applied in successive continuous coats from one to twenty-eight coats over fibrous braid wrapped primary conductors. One end, four ends, or eight ends of wire are handled continuously. System includes letoff, application, drying and constant tension takeup equipment.

• *WIRE ENAMELING SYSTEMS*

Natural and synthetic enamels, silicones, solution nylon, modified plastisol, and similar insulating coatings are applied to bare, cotton or glass covered wire in round, square or rectangular cross section. Ten or twenty simultaneous strands are handled. Systems are complete with letoff, preannealer, application system, capstan and multiple takeup unit.

• *ASBESTOS INSULATING SYSTEMS*

Carded asbestos is applied to continuous single conductor as an integrated operation with saturating, rotary forming, drying, cooling and polishing of the finished wire. Wire from No. 20 gauge to No. 6 AWG is handled through an asbestos wall thickness range of from .008″ to .040″ thickness in a single pass.

• *RUBBER OR PLASTIC JACKETING SYSTEMS*

Rubber and thermoplastic jacketing compounds are continuously applied to electrical wire or cable by the extrusion method. High speed, constant tension letoff and takeup equipment, controlled cooling or continuous vulcanizing equipment are powered by synchronized range drives as complete, integrated wire handling systems. Extrusion machines of customer's choice are furnished.

• *GLASS & VARNISH COATING SYSTEMS*

Double layer of glass or cotton wrapping is applied to round, flat or square conductor. Two individual coatings of high temperature varnish are applied and the finish baked in a continuous operation. Units are complete from letoffs to takeup frames.

• *SELF TRAVERSING REEL CORD DRYERS*

These ingenious machines are used to remove hygroscopic moisture from fibers, braided or knitted flexible cable. These machines increase extrusion speeds, reduce blister scrap loss and improve diameter control. They are easily installed in existing extrusion line.

TECHNICAL INFORMATION ON ANY OF THESE PROCESSES UPON REQUEST

C. A. LITZLER CO., INC.

1817 BROOKPARK ROAD

CLEVELAND 9, OHIO

Other similar reports are planned for release in the coming months, summarizing the growth patterns of industries and products in the other major manufacturing industry groups. Copies of the individual reports will be available, as issued, at 10 cents each, from the U.S. Department of Commerce, Washington 25, D. C.

★ ★ ★

Patents covering 139 inventions now available to small business firms under sale or license are described in the latest issue of the **Products List Circular** issued each month by the SBA. Scientific and industrial firms in the 1957 fiscal year purchased 240,000 copies of Government technical reports through the Office of Technical Services, U.S. Department of Commerce, according to **John C. Green**, OTS director, who said it was an increase of 58,131 copies, or approximately a 33 per cent increase, over the previous fiscal year.

New Hydraulic Cutter for Rods and Bars

For the cutting of steel rods or bars, the Porter Hydraulic Cutter offers a fast, safe tool. One bite cuts through carbon and alloy steel rods, reinforcing rods and drill rod in sizes up to 1⅜″ diameter. Equipment consists of a light weight portable cutterhead, a heavy duty power pump to supply oil pressure and a high pressure hose.

★ ★ ★

The cutterhead has a pistol grip that may be adjusted through a full 360°. A small electric switch button in the pistol grip controls the cutting action.

★ ★ ★

For operator safety the control circuit is reduced to 12 volts. At any time during the cutting cycle the operator need only remove his finger from the control button and the cutting action will stop and blades return to full open position.

★ ★ ★

Design features include extra long blades for good blade alignment, renewable bushings and

wear sleeves at all moving points. The pump unit is equipped with an oil filter, adjustable relief valve and a heavy duty control valve.

★ ★ ★

The cutterheads are available with ¾", 1⅛" and 1⅜" diameter capacity for carbon and alloy steel rods and bars. Weight of heads is 14 pounds, 40 pounds and 105 pounds respectively.

★ ★ ★

The complete units are manufactured by **H. K. Porter, Inc.**, Somerville 43, Mass.

★ ★ ★

The newly completed plant of **City Plating Works, Inc.**, Stratford, Conn., is designed to provide facilities for the latest metal finishing techniques. Located on a two-and-a-half-acre plot on Honeyspot Road, the building covers 17,000 square feet including the office and factory. One-third of the factory area comprises aisle space to assist the material handling program of conveyor and forktruck operations.

★ ★ ★

The plant's reinforced concrete floor contains waste drains and fume exhaust ducts and a 22,000 gallon waste disposal structure, outside the main building, will neutralize all plating solution discharges.

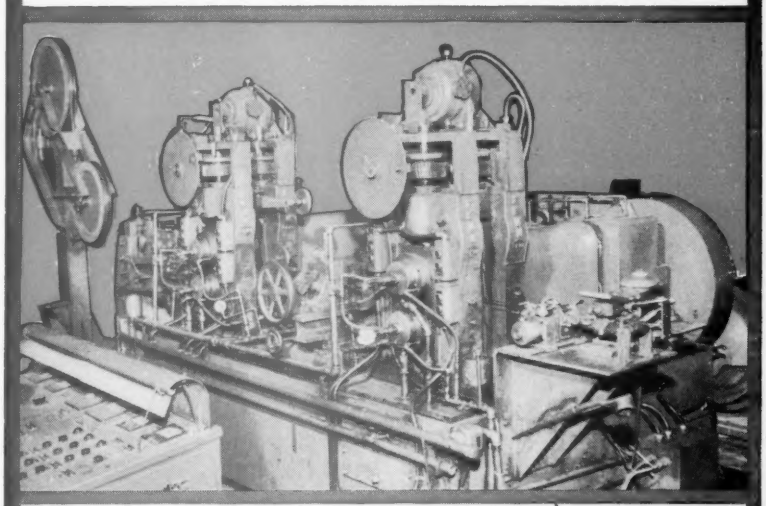
★ ★ ★

City Plating is a job-plating shop specializing in industrial hard chromium plating and specification plating of all types including semi-automatic barrel and rack plating. Much work has been done for the wire industry in chrome plating wear parts of wire machinery, such as capstans, bearings, rings, etc.

★ ★ ★

The company has also added the newly-developed "Crack-Free Hard Chromium Process," which deposits a very dense chromium coating over the entire plated surface. Provisions have been made for various types of anodizing in the near future, including hard anodizing.

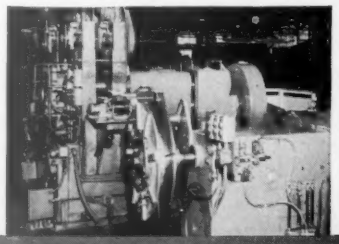
ROLLING WIRE AT 1200 FPM



THIS Fenn Model 082 Tandem Rolling Mill is in operation at the Continental Steel Corporation, Kokomo, Indiana, and is an excellent example of modern, high speed, precision wire flattening. With this mill, Continental reports production speeds of 400 FPM to 1200 FPM. Wire sizes run ranged from 0.5 in. x .130 in. at 1600 lbs., per hour down to .197 in. x .024 in. at 600 lbs., per hour.

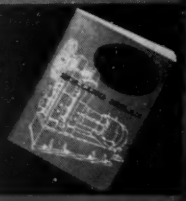
In addition to its precision operation and compactness the Model 082 mill features a one piece bed, automatic loop regulator, power screw-downs, friction-driven edger, electronic gaging, and hydraulically traversing take-up reel.

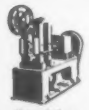
Whatever your requirements for rolling ferrous and nonferrous metals in sheets, strips, wire or rod, it will pay you to investigate the Fenn line of Precision Rolling Mills. Fenn engineering service is available at all times to help you solve any rolling problem.



FENN

SEND FOR NEW FENN ROLLING MILL CATALOG





Precision Rolling Mills

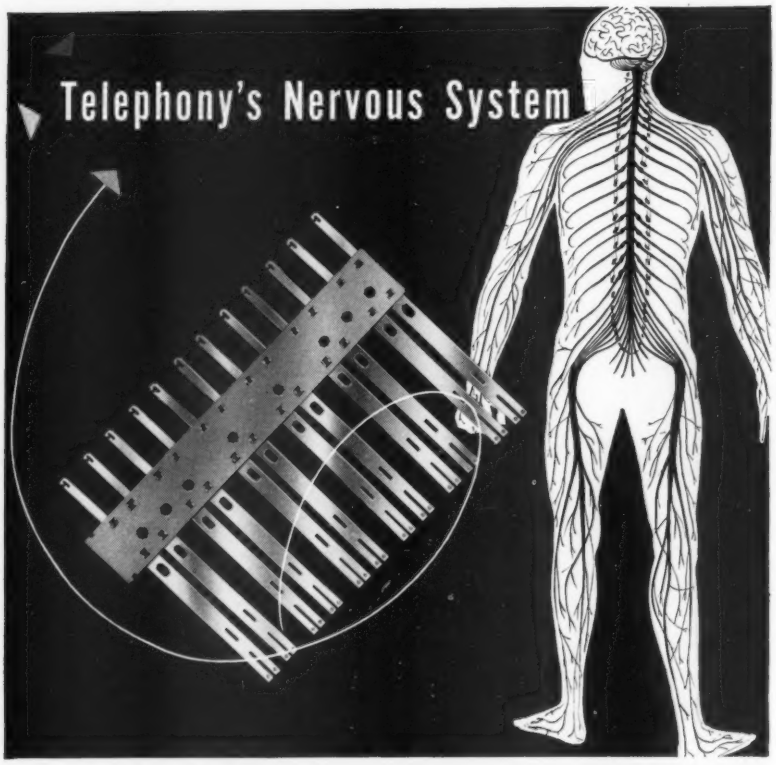
Turks Heads

Wire Shaping Mills

Swaging Machines

Wire and Tube Drawing Machines

THE FENN MANUFACTURING COMPANY • 603 Fenn Road • Newington, Conn.



. . . relies on "neurons" of Seymour Nickel Silver

Dial telephones carry your voice to the ends of the earth through an intricate electrical network which closely resembles the human nervous system. Seymour nickel silver plays a key role in modern communications as part of the North Electric Company "Crossbar Switching System" which automates independent telephone exchanges.

Tiny, neuron-like contacts on North Crossbar switch assemblies rely on flat springs of even-tempered Seymour nickel silver for *trillions* of "makes-and-breaks".

Easy to work, corrosion-resistant and possessing excellent conductivity, Seymour nickel silver has an enviable reputation for quality and uniformity among hundreds of manufacturers who say: — "Specify SEYMOUR. You KNOW it's good!"

Perhaps Seymour metallurgists can help solve your materials problems. Tell us your requirements.

Long distance telephone operators link distant points to the North Crossbar System in Seymour, Indiana.

THE SEYMOUR MANUFACTURING COMPANY
22 FRANKLIN STREET
SEYMOUR, CONNECTICUT

New Lab for Crucible

Joel Hunter, President of **Crucible Steel Company of America,** has announced the establishment of a new Applied Research Laboratory to be located at Crucible's Sanderson-Halcomb Works in Syracuse, N. Y.

★ ★ ★

Dr. A. M. Aksoy will be Manager of the laboratory. He has been Chief Metallurgist for **Vacuum Metals Corp.,** Syracuse, an operating division of Sanderson-Halcomb Works. He will be stationed in Syracuse, but will report directly to **Dr. M. J. Day,** Vice President and Director of Research and Development, whose headquarters is in Pittsburgh.

★ ★ ★

Mr. Hunter said the new laboratory will be a field research facility, operating as an extension of Crucible's central Research and Development Department in Pittsburgh.

New Material Handling Machine for Rod and Wire

A hydraulic loading and stripping machine that simplifies handling of rod and wire coils was recently developed by engineers of **The Lee Wilson Engineering Co., Inc.**

★ ★ ★

The new machine is designed to load or unload a complete stack of coils in a single operation with only one operator in attendance. By using the standard ram truck of "C" hook, the stack of coils to be loaded is placed in the trough of the loading machine. The machine upends the coils to a nearly vertical position over the coil pit which holds the empty spider. Hydraulic cylinders position the spider and elevate it up through the stack of coils in perfect position for crane handling. Unloading is simply the reverse operation. For further information, write Lee Wilson Engineering Company, Inc., 20005 West Lake Road, Cleveland, Ohio.

Outstanding Personalities of the Wire Industry

Buchanan Retires from Republic

Retirement of **D. D. (Buck) Buchanan,** as manager of **Republic Steel Corporation's** Union Drawn Steel Division, and appointment of **Tom M. Girdler, Jr.,** to division manager, were announced by **E. R. Johnson,** vice president in charge of operations for Republic.

★ ★ ★

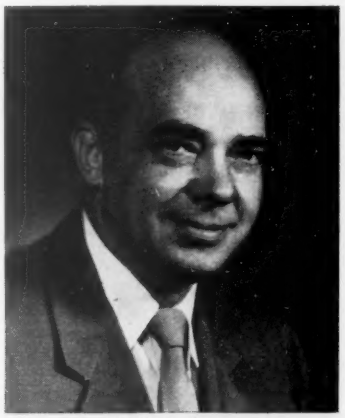
D. D. Buchanan

Tom M. Girdler, Jr.

★ ★ ★

H. B. Anderson, superintendent of Union Drawn's Beaver Falls, Pa., plant, has been named assistant division manager succeeding Mr. Girdler.

★ ★ ★



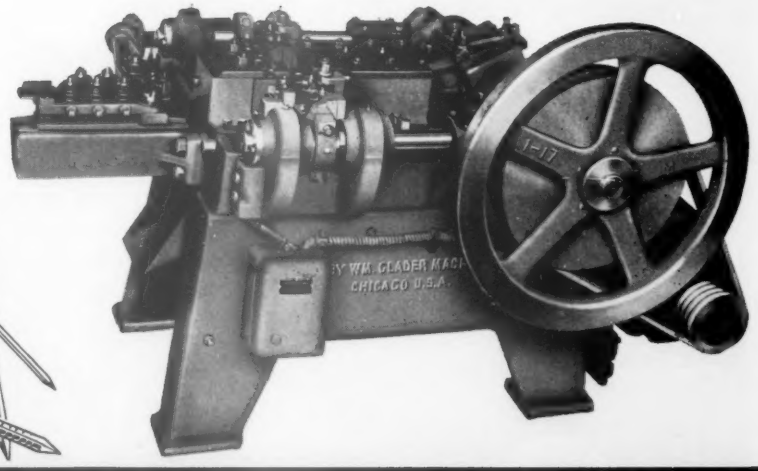
H. B. Anderson

Although Mr. Buchanan has been associated with the steel industry for 54 years, his career

Glader—Years of Proven Performance

GLADER NAIL MACHINES

55 YEARS of experience meeting the exacting demands of nail making.
The machine with a record of steady dependable service.



Wm. GLADER MACHINE WORKS 210 N. RACINE AVENUE CHICAGO 7, ILLINOIS

EXPORT DEPT. 122 EAST 42ND STREET • NEW YORK 17, N. Y.

with Union Drawn began when he was named manager of the company's Beaver Falls Plant No. 3 in 1924. Six years later he was appointed assistant general manager for Union Drawn at the company's headquarters in Massillon, and in December, 1938, he was named division manager, the position from which he retired, effective October 1st. He is a life member of American Society of Mechanical Engineers, a member of American Iron and Steel Institute and a member and past president of The Wire Association.

★ ★ ★

A 1935 graduate of the University of Michigan, Mr. Girdler joined Union Drawn in 1945 and was named assistant superintendent of the company's Beaver Falls plant in 1947, becoming superintendent in 1949. He was appointed to the newly created position of assistant manager of operations for Union Drawn in October, 1952. He is president of The Wire Association and a member of American Iron and Steel Institute.

Mr. Anderson, who is a mechanical engineering graduate of Purdue University, has been associated with Republic for more than 20 years. He joined Union Drawn as an industrial engineer in 1941 following service with Republic's Berger, Bolt and Nut, and Truscon Divisions. He was appointed assistant superintendent of Union Drawn's Massillon plant in 1945 and, in October, 1952, was named superintendent of the Beaver Falls plant, succeeding Mr. Girdler.

★ ★ ★

Bucky will be missed at our conventions and his host of friends will wish him continued health and everything good in the years ahead.

Two Promoted by Johnson Steel & Wire

Two appointments at **Johnson Steel & Wire Company** of Worcester, have been announced by **John H. Greenaway,** manager of operations.

★ ★ ★

George F. Walker, who has been with the company since 1950, has been promoted to superintendent of production and **William H. Eklund,** with the company since 1951, was made supervisor of production scheduling, former post held by Mr. Walker. Mr. Eklund had been turn foreman since 1952.

Veteran Scovill Man Retires

Grayson B. Wood, Cincinnati District Sales Manager, **Scovill Manufacturing Company,** retired on October 1st after 40 years of service to the Company. Some of his older friends in the industry will remember Mr. Wood as American Representative at Scovill for the British Government during the first World War.

★ ★ ★

N. O. Bensenfelder, a veteran of 17 years' service in the industry, has been appointed to succeed Mr. Wood.

STOCK OR CUSTOM.... SMOOTH
BOONTON "PLASTISPOOLS"
are proving to be the most popular fine wire package in the country today. Boonton's "PLASTISPOOLS" are the RUGGED—ONE PIECE—NON RETURNABLE product having the HIGHEST CRUSH and WARP RESISTANCE possible. You can now eliminate costly production tie-ups caused by fine wire catching and breaking on nicks, ridges, and crevices so often found on other spools. Uniform and light weight to reduce shipping costs—colors too, for wire coding or product identification. Write or phone us collect now to see how easily these perfectly engineered Boonton "PLASTISPOOLS" will fit into your present manufacturing set-up.
BM CO
BOONTON MOLDING CO.
BOONTON, NEW JERSEY TELEPHONE DEerfield 4-4400

Heads Wire Mill for Atlantic Steel

Walter G. Patterson has been named Wire Mill Superintendent of **Atlantic Steel Company,** Atlanta. He succeeds **C. L. McGowan,** who retired August first after more than 50 years with the Company.

★ ★ ★

Mr. Patterson began work at Atlantic Steel in 1935 as a Wire Mill Warehouse attendant. Anxious to learn the wire business, he became a machine operator and then moved up to adjuster. In 1946, he was made foreman of the Field Fence, Bale Tie and Barbed Wire Departments. Two years later, he was promoted to general foreman, and in 1951 became Assistant Superintendent of the Wire Mills. He is a member of The Wire Association.

Walter G. Patterson

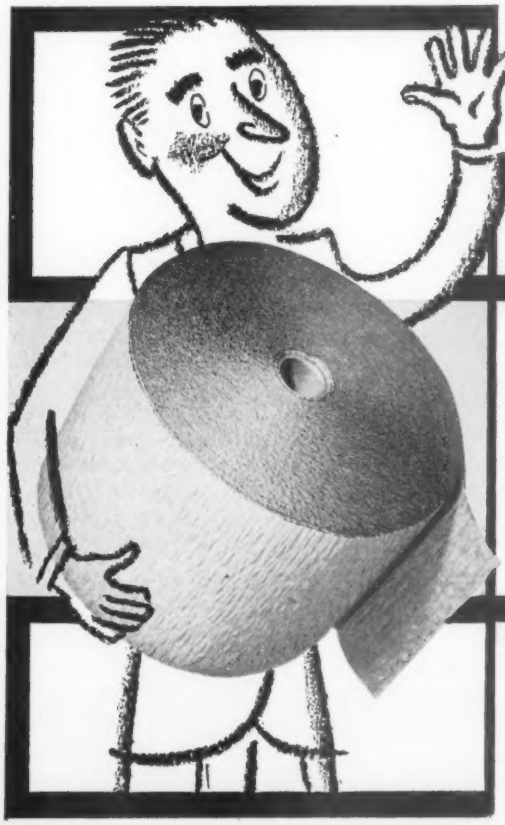
To Manage Armco's Baltimore Works

The appointment of **Chalmers C. McElvain** as manager at the Baltimore Works of **Armco Steel Corporation** was announced by **Clyde G. Davies,** vice-president in charge of operations of the company's Armco Division.

★ ★ ★

He succeeds **G. D. Moomaw,** who is retiring from active service after 45 years in the steel business. He was named assistant manager of the Baltimore Works in January. He has held industrial engineering positions at Armco's general office in Middletown, Ohio, and its Butler, Pa., steel works. He joined the Baltimore organization as works industrial engineer in 1945. He retained that responsibility when he was made administrative assistant to the manager in 1955.

Chalmers C. McElvain



HERE ARE 5 GOOD REASONS FOR USING Rinkle Krinkle Spiral Wrap

1. Only No. 1 Northern Kraft Paper is used in the manufacture of Rinkle Krinkle Spiral Wrap.
2. Rolls can be supplied in any weight, width, or diameter.
3. It is manufactured by a company that has 30 years experience making spiral wrap exclusively.
4. Items wrapped with Rinkle Krinkle Spiral Wrap are very attractive, which greatly increases sales appeal.
5. Five types available include Krinkle Kraft, Krinkle Waxo, Krinkle Waterproof, Krinkle Nylon Reinforced, and Krinkle Resin Laminated.

If you use Rinkle Krinkle Spiral Wrap once, you will want to use it every time.

Rinkle Krinkle Paper Company

MEMBER WAS

326 A STREET, BOSTON 10, MASS.

Chase Announces Three Key Promotions

Three key promotions were announced by **Chase Brass & Copper Co.**, all effective October 1. **Charles L. Denehy,** production control manager for the Chase Metal Works, has gone to the Chase Cleveland Mill as Production Control manager. Appointed to succeed Denehy is **Thomas M. Rianhard,** formerly superintendent of the Sheet Mill at Waterville, while **Kenneth J. McNeill,** who has been general foreman of the Sheet Mill, succeeds Mr. Rianhard. News of these promotions was made known by Works Manager **Gilbert R. Boutin.**

Shawinigan Executive Becomes Consultant

George O. Morrison, assistant to the general manager of **Shawinigan Resins Corporation** has retired from active participation in company affairs it has been announced. He will do consulting work and will continue his association with the firm in this capacity.

★ ★ ★

A veteran of more than 35 years with the Shawinigan family, he is the holder of 20 patents in chemistry and metallurgy. He joined Shawinigan Chemicals Ltd. (Canada) in 1919 as a research chemist and later served as a technical service engineer. In 1944 he was appointed director of research and development for Shawinigan Products Corp. (New York) and in 1955 was named assistant to the general manager of Shawinigan Resins Corp.

★ ★ ★

Well-known throughout the paint and wire industries, he discovered the polyvinyl acetal resins including Formvar, the prime ingredient for magnet wire insulation.

★ ★ ★

He is a member of the National Paint, Varnish and Lacquer Association, the American Chemical Society, The Wire Association and the Chemists' Club.

Wickwire Spencer Sales Appointments

Two appointments in the Wickwire Spencer Steel Division of the **Colorado Fuel and Iron Corporation** were announced on October 8th by **L. A. Watts,** general manager of sales.

★ ★ ★

Earnest J. Bolduc was named New England district sales manager, and **Charles P. Harlow** will be sales manager of the hardware products department.

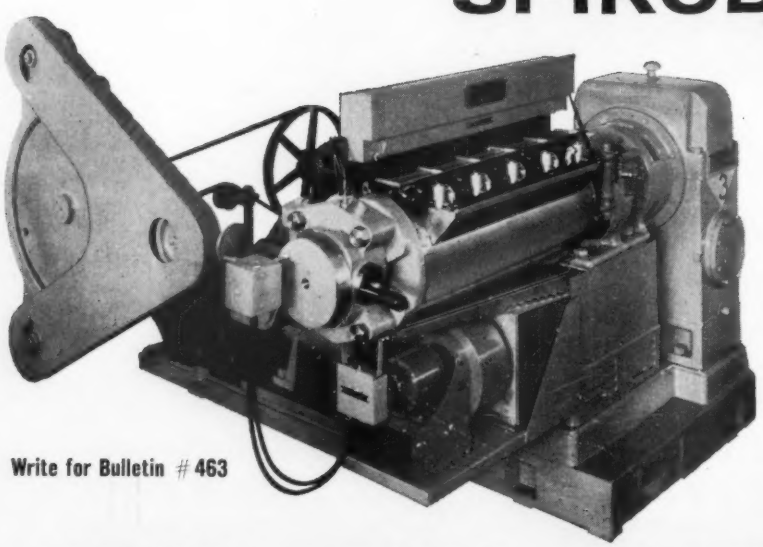
★ ★ ★

Mr. Bolduc, whose office is at the company's New England headquarters in Boston, Mass., has been associated with Wickwire Spencer since 1920. Until his recent appointment, he was Coburn products sales manager.

★ ★ ★

ROYLE

SPIROD® for Rubber or Plastic Wire Insulating



Write for Bulletin # 463

These all electric extruders with radiant heat and high velocity evaporative cooling are designed to process either plastic or rubber compounds. The result of more than three quarters of a century of experience — Royle pioneered the extrusion process in 1880— in the design and construction of extruding machines time tested features have been built into Spirod to assure dependability.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — Hyde Park 2430 - 0456

Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262

Akron, Ohio — J. C. Clinefelter Co. — BLackstone 3-9222

Downey, Cal. — H. M. Royal, Inc. — TOpaz 1-0371

Tokyo, Japan — Okura Trading Co., Ltd. — (56) 2130 - 2149

Mr. Harlow has been with Wickwire Spencer Steel since 1936. Prior to his recent appointment, he was assistant sales manager of the New England Area. He is assigned to the corporation's subsidiary, **American Wire Fabric Corporation,** Mt. Wolf, Pa.

Johnson and Mackay Promoted by Bethlehem Steel

Bethlehem Steel Company has announced, effective November 1st, the appointment of Carl E. Johnson as an assistant general manager at the company's Sparrows Point, Md., plant.

★ ★ ★

At the same time, the company announced that **W. Roy Mackay** will succeed Mr. Johnson as superintendent of the rod and wire division at Sparrows Point, that **R. A. McCarthy** moves into Mr. Mackay's previous position of assistant superintendent of the rod and wire division, and that N. T. Nelson, Jr., has been appointed an assistant to superintendent of the same division.

★ ★ ★

Mr. Johnson is a past-president

Carl E. Johnson

and former director of The Wire Association and Mr. Mackay is currently a director. Both have been active in Association affairs for many years.

Represents Plandex in East

Robert S. Bicking has been appointed to represent the **Plandex Corporation,** Chestnut St., Downington, Pa., in the East, according to an announcement by **Richard C. Elliott,** Vice President.

★ ★ ★

The company has complete facilities for the re-processing of plastic and rubber scrap materials, the process covering sorting, grinding, compounding, blending, coloring, straining, pelletizing and batching to restore virgin characteristics to exact specifications.

To Represent Heany in Midwest

The appointment of **Jack P. Williams,** 20 North Wacker Drive, Chicago 6, Ill., to represent the **Heany Industrial Ceramics Corp.,** New Haven 3, Conn., has been announced by the company.

★ ★ ★

Mr. Williams will handle the sale of Heanium wire and thread

CONVENTION PAPERS WANTED! . . .

The Program Committees for the 1958 Annual Convention of The Wire Association will be pleased to receive offers to present Technical Papers next October in Atlantic City from members.

If you have ideas as to a subject and would be willing to write the paper before next July 1st, please let us know and we will see that your offer gets into the proper hands.

All papers presented by Association members are eligible for Medal Awards and Certificates of Honorable Mention in The Ferrous and Non-Ferrous Divisions and cash awards of $100.00 and $50.00, respectively, will accompany each award. Speakers for this meeting will also be given complimentary registrations.

Send your suggestions to

THE WIRE ASSOCIATION

453 MAIN STREET • **STAMFORD, CONNECTICUT**

guides in the North Central area, which includes Illinois, Indiana, Ohio, Michigan, Missouri and Wisconsin.

★ ★ ★

Heanium is a long-life ceramic used extensively in the wire and textile industries, wherever guide wear is a problem. The material is extremely hard and durable and takes a high polish.

New Fenn Sales Manager

A. T. Scattergood, Vice President in charge of Sales and Engineering at the **Fenn Manufacturing Company,** Newington, Conn., has announced the appointment of **John H. Charpentier** as Sales Manager of the Machinery Division, which manufactures an extensive line of metal forming equipment that includes Precision Rolling Mills, Swaging Machines, Draw Benches and allied equipment.

★ ★ ★

He joined the Fenn organization in 1947, was elected Assistant Secretary in 1953 and became associated with the Sales Department in 1955. He attended Tufts College and the Graduate School of Credit and Financial Management at Dartmouth.

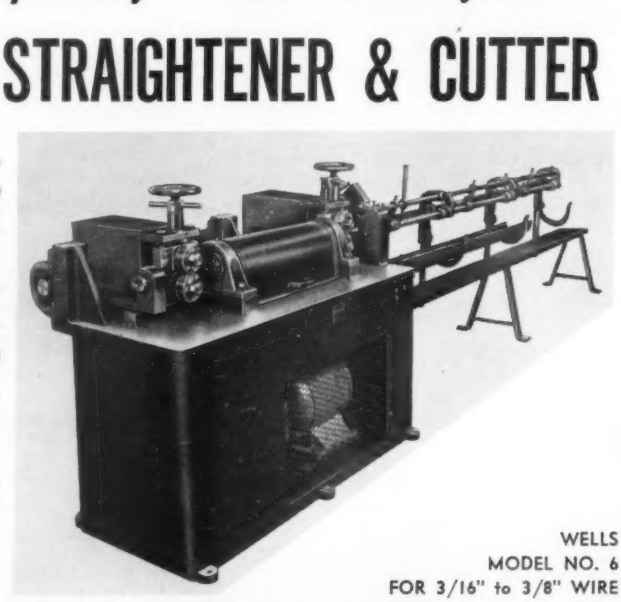
A Completely New, Redesigned

WELLS STRAIGHTENER & CUTTER

THE MODEL NO. 6 IS FASTER AND MORE ACCURATE.

SPEED — UP TO 145 F.P.M. CUTTING WIRE IN 12 FT. LENGTHS.

RUGGED CONSTRUCTION FOR LONG CONTINUOUS SERVICE.



WELLS
MODEL NO. 6
FOR 3/16" to 3/8" WIRE

WELLS' NEW MODEL NO. 6 is the fastest Straightening and Cutting Machine in this size range.

It is powered with a 12½ H.P. motor completely enclosed in the base and is over 25% faster than previous models. All working parts are accessible.

WELLS S&C MACHINES have a reputation for stand-up under the most difficult operating conditions and this new model will continue the tradition.

OTHER MODELS FOR SMALLER AND HEAVIER WIRE.

WRITE FOR CATALOG ON THE COMPLETE LINE.

Frank L. Wells Company

Builders of Fine Wire Working Machinery

5821 FIFTH AVENUE • KENOSHA, WISCONSIN

I.O.I. Appoints New England Representative

The appointment of **E. W. Maass** of East Hampton, Conn., as New England Representative for **Industrial Ovens, Inc.** has been announced by President **Howard R. Richards.**

★ ★ ★

I.O.I. designs, manufactures and installs continuous materials handling and processing systems, generally involving the engineered application of heat, for the plastics, rubber, paper, textile, film and wire industries. The firm is located at 13825 Triskett Road, Cleveland 11, Ohio. Mr. Maass' address is Box 73, East Hampton, Conn.

★ ★ ★

Mr. Maass established his plastics equipment manufacturers' agency in East Hampton in 1955. Immediately prior to the formation of his agency, he served as an engineering consultant to many plastics and allied firms in New England. He is a chemical engineering graduate of Rensselaer Polytechnic Institute and has served as an engineer with the Du Pont and American Optical Companies and as Plastics Division Manager for National Vulcanized Fibre.

Appointments at Riverside-Alloy Metal

Two recent appointments at **Riverside-Alloy Metal Division, H. K. Porter Co.,** have been announced. **A. W. Renken** was appointed Plant Superintendent of Riverside Metal Works, while **R. H. Wilson** is now Administrative Assistant for the Division.

★ ★ ★

Mr. Renken, who has had 24 years of rolling mill experience, joined the Porter division as Superintendent of the strip mill in June,

1956. In his new position, he will be responsible for the operation of the Riverside plant and will report to **D. K. Davis,** Works Manager, who has general responsibility for the Division's three plants.

★ ★ ★

Mr. Wilson, who joined Riverside in 1949, had been in charge of improvement and development of the Riverside plant. During the past two years, he had acted as planning coordinator for the modernization of Riverside's strip mill.

Roebling Sales Changes

Fred H. Ueckermann was named Chicago district manager, wire rope division, **John A. Roebling's Sons Corp.,** as of November 1, according to **Walter A. Huber,** the division's general product manager. For the past eight years he has headed the Atlanta district office and he succeeds **Carl H. Walles,** who leaves on October 31, to go into business for himself.

★ ★ ★

Harry L. Truitt, Jr. will replace Mr. Ueckermann at Atlanta. He has been a sales representative in the Florida territory for the past five years. He is a graduate of the University of Tampa.

Rome Cable Appoints Three to Sales Staff

Appointments to **Rome Cable Corporation's** field sales staff were announced recently by **Glenn E. Rolston,** vice president and marketing director. **Edward M. Groves, David S. Smith** and **D. Blake Duffy** were named salesmen in the Cincinnati, Ohio; San Francisco, California; and Seattle, Washington offices respectively.

★ ★ ★

Mr. Groves joined the company in 1956 after graduating from Bryant College, Providence, R. I., with a degree in business administration. He is the firm's first resident salesman assigned to the Cincinnati office.

★ ★ ★

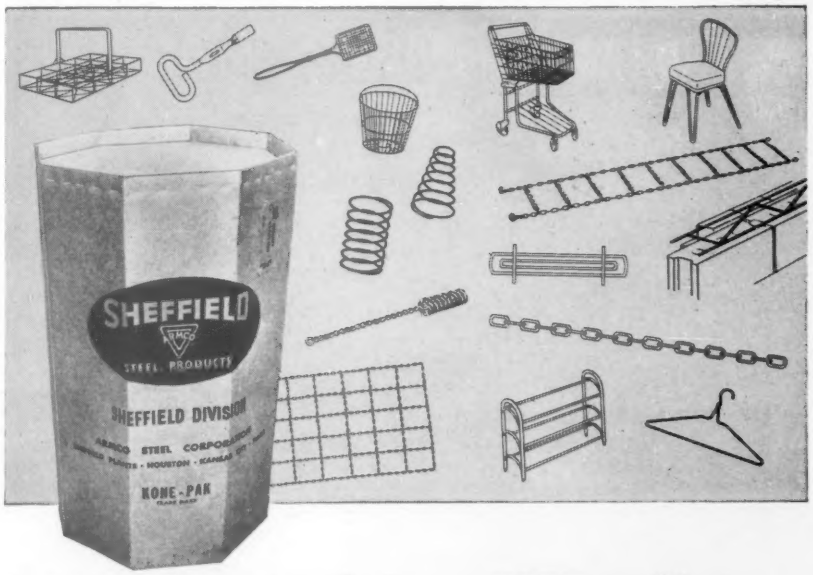
Mr. Smith has been with Rome Cable since his graduation from Colgate University, Hamilton, N. Y., in 1953. Formerly, he worked in the firm's engineering and advertising departments.

★ ★ ★

Mr. Duffy was formerly with the New York State Department of Mental Hygiene, the Albany (N.Y.) County Welfare Department, and the advertising and sales departments of the Rochester, New York Times Union. He is a graduate of St. Mary's College, Baltimore, Md.

To Head Copperweld

James M. Darbaker has been elected the Chief Executive Officer of **Copperweld Steel Company,** filling the vacancy in that position caused by the recent death of **Frank R. S. Kaplan.** Mr. Darbaker will continue as President of the Company and will also serve as Acting Chairman of the Board of Directors.



Let us help untangle your WIRE problems...

We're old hands at it. If you use manufacturers' wire, you may have a lot to gain by getting in touch with your nearby Sheffield office. Our metallurgists and wire specialists can analyze your wire uses and make recommendations that may speed production, improve products and cut costs for you.

Sheffield's steelmaking and wire drawing facilities enable us to supply the right wire for any set of specifications. We're doing it for manufacturers and fabricators of more than 2000 different products. We'll not only come up with the right wire for you, but we are often able to recommend more economical ordering units.

Finally, there's Sheffield packaging. Our Kone-Pak* gives you in one continuous spool the equivalent of 2 to 40 ordinary coils. Kone-Pak saves handling and machine downtime for loading. With it comes the protection of specially treated wrapping that assures rust-free delivery and storage of your wire.

Just call your nearest Sheffield office.

**Pat. Pending*

SHEFFIELD

Wire Products

Sheffield serves the Midwest, Southwest and Gulf Coast with one of the most diversified lines of finished and semi-finished steel products in the steelmaking industry.

SHEFFIELD DIVISION ARMCO STEEL CORPORATION
SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA — OFFICES IN PRINCIPAL CITIES

Frank R. S. Kaplan

Frank R. S. Kaplan, prominent businessman, attorney and civic leader, died in his home at 5251 Fair Oaks St., Squirrel Hill, Pittsburgh, Pa. He was 71 years of age.

★ ★ ★

Mr. Kaplan was Chairman of the Board and Chief Executive Officer of the **Copperweld Steel Company.** He was one of the founders of the company in 1915 and had been Chairman of the Board since 1955.

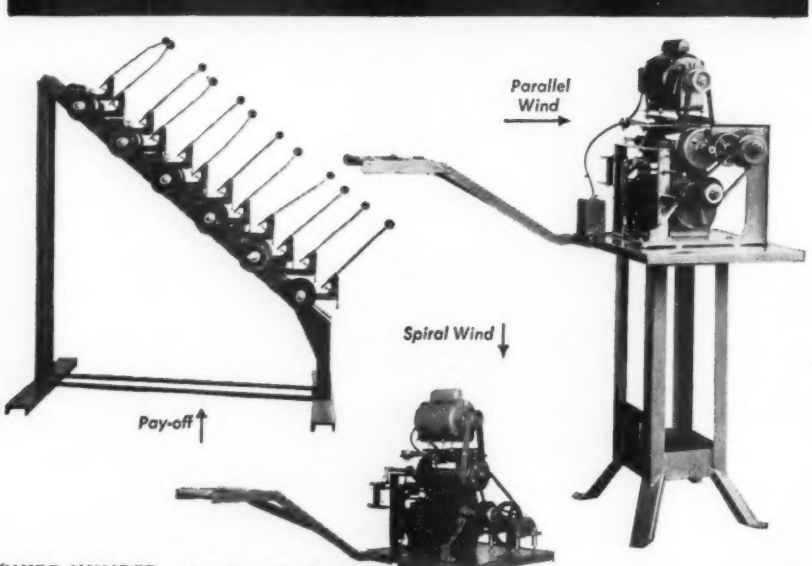
A. R. Zapp

August R. Zapp died on November 9, 1957, and was buried in The Arlington Cemetery, Washington, D. C.

★ ★ ★

Mr. Zapp, known affectionately as "Gus" to his host of friends in the wire industry, had been an officer in the Navy during World War I. He organized the Carbide Division of the Firth Sterling Steel Co., Pittsburgh, and brought it to the forefront of the carbide die and tool industry. He had been an active member of The Wire Association for many years, before his retirement from the company.

STANDARD UNI-DRIVE WIRE WINDER



WIRE WINDER Our New Uni-Drive Wire Winder is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel — no over or under-winding. Can also be furnished with a slight spiral pattern for winding exceedingly fine wire. Automatic Stop Motion controls each strand. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors.

Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAY-OFF Our Pay-off Attachment consists of a heavy fabricated frame on which Pay-off spools are mounted to cover desired number of ends to be wound. Equipped with spindles, running on self-aligning ball bearings, with size of spindles and adapters to accommodate customers' pay-off spool. Compensating Attachment to control the tension of each individual strand of wire, applying the same tension when spool is full as when empty. Can also be adapted for use with bunching machines.

STANDARD MILL SUPPLY COMPANY
31 ESTEN AVENUE PAWTUCKET, R. I., U. S. A.

Tensolite Names Sales Manager

Tensolite Insulated Wire Co., Inc. of Tarrytown, N. Y., one of the Nation's leading manufacturers of high temperature wire and cable, has announced the appointment of **Jack L. Shafer** as Vice President in charge of the company's newly expanded Sales Department. Mr. Shafer was formerly General Sales Manager of the Plastics Division of the Curtiss-Wright Corp. and prior to that time, was General Sales Manager of the Industrial Products Division of the General Tire and Rubber Company. He holds a Bachelor's Degree in Chemical Engineering from the Case Institute of Technology, Cleveland, Ohio.

New 180° C Wire Enamel

An electrical insulating varnish-wire enamel system that will withstand hot spot temperatures of 180 C yet can be applied and cured at conventional temperatures, has been announced by **Schenectady Varnish Company, Inc.,** Schenectady, N. Y.

★ ★ ★

The system is made possible by a new wire enamel and a new insulating varnish developed by the firm. Designated as Isonel No. 175 wire enamel and Isonel No. 31 high bonding insulating varnish, they are both polyester-type materials, capable of operation at Class F temperatures of 155 C. Used together, however, they complement each other and make possible sustained operation at 180 C.

★ ★ ★

The new varnish is applied by conventional techniques and cured at regular temperatures of 290-325 F. Because of their heat resistance and excellent adhesion, the new enamel and varnish are well suited for use in motors and generators which operate at high speed and high temperatures. Isonel No. 175 wire enamel and Isonel No. 31 varnish are made by the firm in Schenectady, N. Y. They are available in unlimited quantities.

Wire and Wire Products to be Indexed

The H. W. Wilson Company, 950 University Ave., New York 52, N. Y., publishers of indexes and reference works, has requested and been granted the privilege of indexing **Wire and Wire Products.** This service will be carried in their "Applied Science and Technology Index" starting with the January, 1958, issue. Not only will articles be listed by title and subject, but important subjects treated within an article will be cross-referenced.

★ ★ ★

Wilson has been rendering services of this nature since 1898 and has built a large and thriving business upon its reputation for thorough, accurate and needed indices and other reference works.

New Package for Nails

A brand new see-through package for aluminum nails, designed to ease the hardware dealer's selling job, has been announced by the **Aluminum Company of America.**

★ ★ ★

The firm's latest entry into the household consumer market, the package was first shown at the National Hardware Show at the New York Coliseum on October 14th.

★ ★ ★

Ten different types of "most

used" nails for home craftsmen, presorted and precounted to eliminate handling problems, are available in colored boxes. Each acetate-windowed package contains from 100 to 450 nails, depending on nail size. Individual packs are shipped to dealers in a twelve-unit self — merchandising carton for point-of-purchase display.

Sling Chains

A concise, yet comprehensive dissertation on the properties and capabilities of ACCO Registered Sling Chains is contained in a 4-page bulletin, DH-101, which has been made available by the American Chain Division, **American Chain & Cable Co., Inc.,** York, Pa.

★ ★ ★

Featured is a listing of the 7 main points to consider when ordering sling chains. Also of interest is a chart giving the working load limits of 2-leg chains fashioned of X-Weld 125 or Endweldur 125 Chain, based on 50 per cent proof tests.

SCHLATTER
WELDING MACHINE FOR REINFORCEMENT NETTING
Sole Representative: PAUL REICHER
MACHINERY & EQUIPMENT
P. O. Box 127, Willowdale, Ont., Canada
H.A. SCHLATTER LTD. ZOLLIKON/ZURICH
Manufacturers of electric welding machines (Switzerland)

A Review of Recent Wire Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.

Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.

No. 2,807,869, METHOD OF WINDING A WIRE COIL, patented October 1, 1957 by Lyman A. Rice, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware.

A number of wire wrapped coils are simultaneously wound from separate supply sources, each of which, when wound, has a number of layers of wire windings and has both ends of the wire, used for winding, exposed to the exterior of the coils.

★ ★ ★

No. 2,808,642, METHOD OF MAKING A COIL OF WIRE, patented October 8, 1957 by Silas C. Fons and William V. Rollins, Waukegan, Ill., assignors to United States Steel Corporation, a corporation of New Jersey.

The inventors provide a method of covering the wire coils with paper or cardboard.

★ ★ ★

No. 2,808,805, DEVICE FOR PROTECTING COATINGS ON WIRES, patented October 8, 1957 by John P. Tesmer, Cleveland, Ohio.

Metal coatings are applied to wire by this apparatus. There are five claims.

★ ★ ★

No. 2,809,229, INSULATED CONDUCTOR, patented October 8, 1957 by Warren H. Eckels, Kingston, N. Y., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Del.

Pairs of spaced-apart wire conductors are individually coated with insulation and a web of the insulation is extended diagonally from the surface of the insulation surrounding one wire conductor to the surface of the insulation surrounding the other wire conductor.

★ ★ ★

No. 2,809,230, INSULATED COIL, patented October 8, 1957 by Graham L. Moses, Pittsburgh, and Marvin M. Fromm, Greensburg, Pa., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania.

Surrounding the wire coil is resilient insulation encasing the wire, the insulation comprising a pair of preformed mating cap members molded of silicone elastomer.

★ ★ ★

No. 2,809,272, APPARATUS FOR SELECTIVELY FORMING AND WELDING CONTACTS ONTO WIRE SPRING RELAY PARTS, patented October 8, 1957 by Robert O. Birchler, Cicero, Ill., and Robert F. Schalk, Madison, Wis., assignors to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

There are twelve claims to this apparatus. Included is a number of switches settable to different positions for establishing various control circuits in response to movement of an article supporting means of the apparatus successively to operative positions for selectively rendering a stopping means operable to stop the article supporting means for predetermined intervals at selected operative positions and for rendering a welding means operable during these intervals to effect the welding of contacts onto selected conductors of the article.

★ ★ ★

No. 2,809,674, ADJUSTABLE COIL-WINDING CORE, patented October 15, 1957 by John W. Ward, Fort Smith, Ark.

The construction of the core is such that rotation of the core shaft in one

NORBIDE Abrasive Grain...
cuts die Refinishing Costs!

If you are still using costly diamond dust for refinishing your wire drawing dies, you'll be amazed at the savings you can make by switching to NORBIDE Abrasive. Wire mills everywhere have found that this abrasive—the hardest manufactured abrasive commercially available—is ideal for ripping and semi-finishing operations.

Many of our customers order NORBIDE Grain in 100 lb. drums. Many others order and re-order ¼ lb. and ½ lb. cans. No matter what your requirements are we can fill your order promptly from stock.

For details and prices on this cost-cutting abrasive write for Form 559.

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NORBIDE® | *The hardest manufactured abrasive commercially available!*

direction moves the coil support bars away from the shaft and rotation of the shaft in the opposite direction draws the bars toward the shaft.

★ ★ ★

No. 2,809,675, SPRING HOOK FORMING MACHINE, patented October 15, 1957 by Louis J. Silko, Grand Rapids, Mich., assignor to McInerney Spring and Wire Company, Grand Rapids, Mich., a corporation of Michigan.

A machine is provided for forming hooks on the projecting ends of wire coiled springs. There are six claims.

★ ★ ★

No. 2,809,767, COLLAPSIBLE WIRE CARRIER, patented October 15, 1957 by Peter Michalsky, Garfield, N. J.

The carrier relates to bottle carriers and includes wire top and bottom frames, movably secured together by wire links, and a wire handle.

★ ★ ★

No. 2,810,011, ELECTRIC CABLES, patented October 15, 1957 by Harvey Burr, London, England, assignor to International Standard Electric Corporation, New York, N. Y., a corporation of Delaware.

More specifically, the six claims cover a process for producing a pair of insulated wires of small overall cross section useful in multiconductor telephone type cable, with a strip of thin insulating paper between the wires. The opposite edges of the strip being wrapped about the wires slightly more than one turn, whereby the inner edges of the insulating paper are held down by the outer turns of paper so that the two wires are completely covered. and during the wrapping operation bringing the wires and the insulation together compactly, and heat and pressure being employed to iron smooth and permanently set the insulation around the wires.

★ ★ ★

No. 2,810,431, SEAT SPRING ATTACHMENT, patented October 22, 1957 by Napoleon P. Boretti, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware.

For the purpose of attaching the ends of the sinuous wire springs from the seat frame, the inventor provides a pair of special rods having offsets for cooperation with offsets of the wires. There are eleven claims.

★ ★ ★

No. 2,810,669, METHOD OF MAKING ELECTRICAL CABLES, patented October 22, 1957 by Marcel Heupgen, Jeumont, France, assignor to Forges et Ateliers de Constructions Electriques de Jeumont, Paris, France, a corporation of France.

The invention covers the method of protecting and reinforcing an electric cable with a reinforcing wire and a hermetically sealed elastic envelope sealing the wire and the cable.

★ ★ ★

No. 2,810,993, PRODUCTION OF HELICAL SPRINGS HAVING FACE-GROUND ENDS, patented October 29, 1957 by Ernst Stegmann, Wangen, near Olten, Switzerland, assignor to Emil Schenker A. G., Schonenwerd, Switzerland.

There are nine claims to this patent for an apparatus for operating on a helical spring at predetermined longitudinal locations of the latter when the spring is continuously rotated and continuously fed thereto.

★ ★ ★

No. 2,811,010, PREFORMING HEAD FOR WIRE STRANDING MACHINE, patented October 29, 1957 by Joseph Balint, Sr., Yardville, N. J. assignor to United States Steel Corporation, a corporation of New Jersey.

This head comprises a preforming head for a stranding machine comprising a tubular body and a number of quills fixed to the outer circumferential face thereof and converging as a group toward one end of this body, each of the quills being formed of a hard block shaped as a geometric solid which has spaced apart opposed inner and outer faces on its opposite sides, the inner face bearing against the body and the outer face being exposed throughout its area and containing a system of angularly related grooves defining a course of positive continuous sinuous outline when viewed in plan open throughout its length outwardly of the quill and confined to the outer face to receive a component for forming into a helix.

★ ★ ★

No. 2,811,063, WIRE CUTTER AND

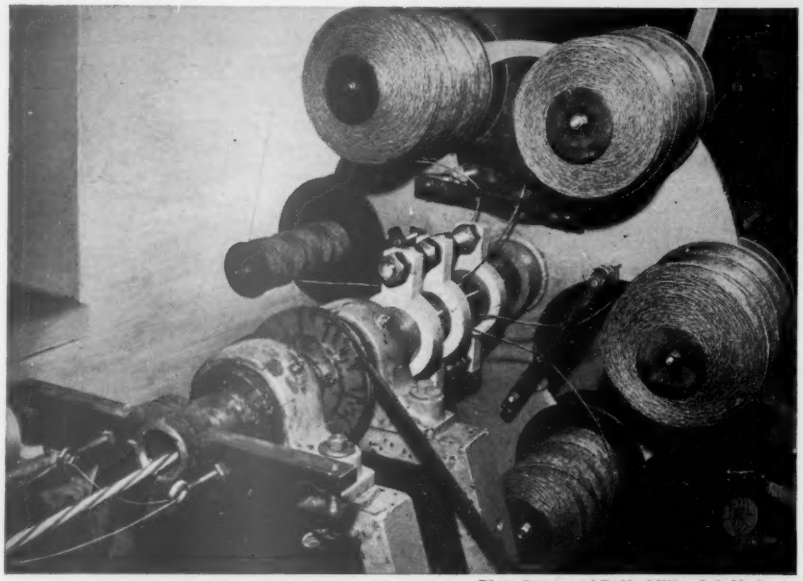

Photo Courtesy of Bedford Wire & Cable Corp.

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You save time and money in your cabling operation when you use Plymkraft Cable Filler. Its greater fill capacity, greater uniformity, assure you of a better looking cable. Made to fit your particular standard of manufacturing, Plymkraft is treated to meet various moisture, strength and fungi requirements. Smooth running Plymkraft is also ideal for highspeed cablers where extra strength is a must. Use Plymkraft Cable Filler, your best bet for clean, efficient cabling.

To keep up to date with cable filler developments, it takes only an inquiry for samples of Plymkraft. To find the quality cable filler best-suited for your wire needs, write today to:

PLYMKRAFT DIVISION

PLYMOUTH CORDAGE COMPANY

PLYMOUTH, MASSACHUSETTS

INSULATION STRIPPING APPARATUS, Patented October 29, 1957 by Floyd G. Eubanks, Pasadena, Calif., assignor of ten percent to Robert M. McManigal, South Pasadena, Calif.

There are eleven claims. The apparatus comprises first and second cutters cooperable to sever the wire and the insulation only adjacent the cut made in the wire; electro-magnetic device for independently actuating each of the cutters including an energizing circuit; a mechanical interlock interconnecting the first and second cutters for simultaneous operation; means for feeding material with respect to the cutters; switch contacts for controlling the energizing circuit; and a device for actuating the contacts in timed relation to the feeding speed of the material.

★ ★ ★

No. 2,811,073, THREE LEGGED STAPLE, patented October 29, 1957 by Hans Klopstock, London, England, assignor to Lindsay Stevens Carstairs, Monken Hadley, England.

A single length of wire is formed into a three-legged staple with the intermediate leg comprising two parallel lengths of wire with curved ends to define a bulbous intermediate tip.

★ ★ ★

No. 2,811,193, HELIX WINDING MACHINE WITH PITCH GUIDE MEANS, patented October 29, 1957 by Arthur H. Iversen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif., a corporation of Delaware.

Included is a helix pitch establishing follower disposed from the carriage and engageable with a penultimate winding of the wire about a mandrel with a wire guide and a longitudinally mounted follower contacting the wire on like lateral surfaces thereof, the surfaces being on trailing sides of the wire relative to the direction of axial traverse of the wire longitudinally along the mandrel; and a device for continuously biasing the carriage to force the follower into contact with the lateral surface of the winding engaged thereby to form a coil as the mandrel is rotated.

★ ★ ★

No. 2,811,472, BLACK GRID WIRE COATING, AND A METHOD AND DEVICE FOR PRODUCING IT, patented October 29, 1957 by Verne D. Snyder, Emporium, Pa., assignor to Sylvania Electric Products, Inc., a corporation of Massachusetts.

The method comprises passing the wire through a flame having an inner oxidizing zone and an outer envelope forming a reducing zone with the wire just skimming the oxidizing zone as it enters the flame.

Center-Stripped Wire Leads Permit Fast, Neat Assembly

Manger Electric Company now offers centerstripping as one of its custom wire processing services. The firm has developed specialized equipment to remove the insulation from stranded or solid conductors of any gauge.

★ ★ ★

The stripped portion may be any length from a minimum of 1/8", and may be located at either regular or irregular intervals throughout the length of the wire. Leads can be cut, end-stripped and counter-stripped as required, or they can be supplied in a continuous coil.

★ ★ ★

Centerstripping is of particular interest to manufacturers of products where multiple banks of electrical components have common terminating points. One continuous centerstripped wire can be used in place of two or more single leads. This results in neater, faster assembly, improved connections and lower installation cost.

★ ★ ★

For further information, write to Manger Electric Co., Miller St., Stamford, Conn.

Here is the difference between just any reel and MPS reels with
DURA CURL RIMS
Yes, it's the exclusive MPS heavy duty thickened-section rims that assure maximum strength and rigidity throughout the reel heads. Flange run-out and straightening expenses are eliminated by this patented MPS development. DURA-CURL rims are now standard on all MPS wire drawing, annealing, and stranding spools and reels. We invite your inquiries — let us tell you more about Dura-Curl rims.
MPS
trouble-free winding spools and reels
Mossberg PRESSED STEEL Corporation
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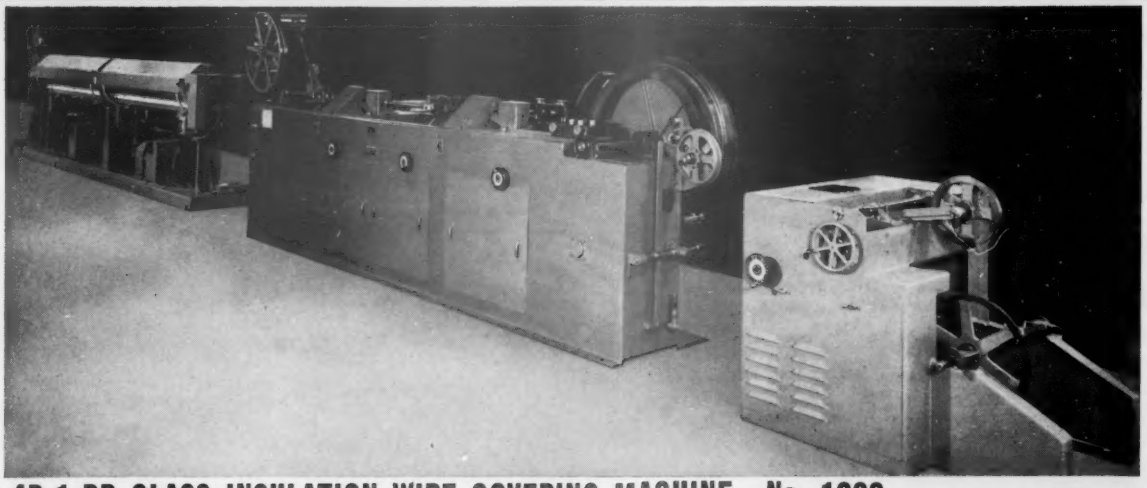
COPPER – Consumption of refined copper in the United States July-August 1957, in short tons

	Wire mills 1/	Brass mills 2/	Chemical plants	Secondary copper smelters	Foundries and miscellaneous	Total
July:						
Cathodes	234	4,580	(3)	36	(3)	4,850
Wire bars	43,563	3,942	(3)	---	(3)	47,505
Ingots and ingot bars	859	4,716	(3)	24	(3)	5,599
Cakes and slabs	------	9,587	(3)	---	(3)	9,587
Billets	------	10,912	(3)	---	(3)	10,912
Other	46	------	(3)	32	(3)	78
Total	44,702	33,737	(4)	92	(4)	4/81,531
August:						
Cathodes	79	7,046	(3)	75	(3)	7,200
Wire bars	65,012	4,636	(3)	---	(3)	69,648
Ingots and ingot bars	1,601	6,321	(3)	247	(3)	8,169
Cakes and slabs	------	13,464	(3)	2	(3)	13,466
Billets	------	13,616	(3)	---	(3)	13,616
Other	86	------	(3)	44	(3)	130
Total	66,778	45,083	(4)	368	(4)	4/115,229

1/ Includes all wire mills with rod-rolling facilities.
2/ Includes all brass mills using copper in refinery shapes; some have rod-rolling facilities.
3/ Not available.
4/ Consumption by chemical plants, foundries, and miscellaneous plants not included. Estimate of 3,000 tons included in total.



4D-1-BB GLASS INSULATION WIRE COVERING MACHINE No. 1088 Patented Aug. 3, 1943

WITH VARIABLE SPEED DRIVE.
TORQUE MOTOR DRIVEN TAKE-UP REEL STAND
BALL AND ROLLER BEARING MOUNTED
BAKING OVEN WITH DOUBLE VARNISH APPLICATOR
AND AUTOMATIC TEMPERATURE CONTROLS.

WIRE DRAWING, ENAMELING, TINNING, INSULATING,
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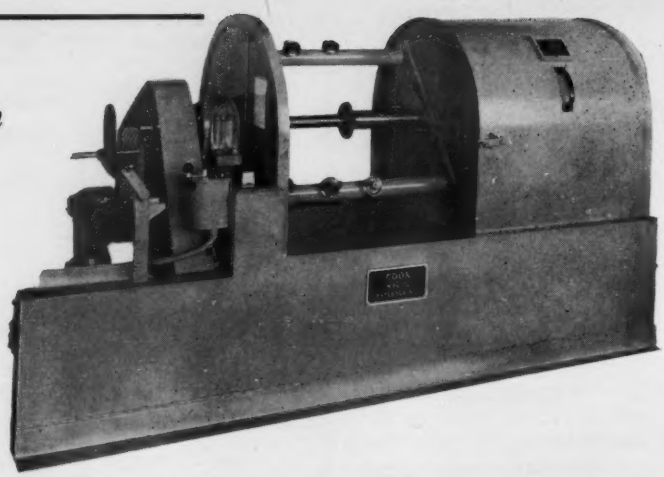
Your answer for producing bunched wire with the smooth concentric qualities of stranded wire . . .



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makes every foot of wire perfectly uniform

For concentric wires with layers made up of wires in opposite lay directions, or for semi-concentric wire with layers in same direction but with different lays . . . a Cook Buncher-Strander delivers uniform wire at high speed. The secret is the single twist flyer and the Cook patented method of providing differential speeds between flyer and reel. Why delay? Get the complete details today by writing for illustrated brochure.

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MODELS AVAILABLE	BH-8	BH-12	BH-16	BH-22	BH-24
CAPACITY	45 lbs.	90 lbs.	200 lbs.	500 lbs.	1000 lbs.

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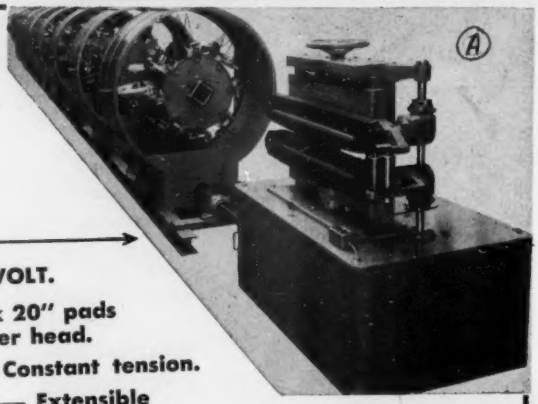

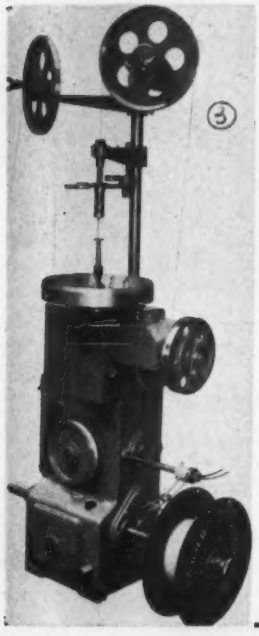

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- — High speed paper lapping.
- — 3,000 r.p.m.
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- — Central lubrication.

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- — 8 x 20" pads per head.
- — Constant tension.
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- — Individually braked.
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AIS 10

Total Number of Companies Included 127

AUGUST - 1957
Month

SHIPMENTS OF STEEL PRODUCTS
ALL GRADES INCLUDING CARBON, ALLOY AND STAINLESS
(Net Tons)

Covering Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or for Resale)

Steel Products	Items	CURRENT MONTH 1957 Carbon	Alloy	Stainless	Total	Percent of Total Shipments	Prior Year (1956) Percent of Total Shipments	YEAR TO DATE 1957 Carbon	Alloy	Stainless	Total	Percent of Total Shipments	Prior Year (1956) Percent of Total Shipments
Ingots and Steel Castings	1A	26,869	15,279	1,190	43,338	0.7		190,369	135,432	17,262	343,063	0.6	0.8
Blooms, slabs, billets, sheet bars	1B	121,697	31,495	1,378	154,570	2.5		1,483,510	305,693	15,159	1,804,362	3.2	2.8
Tube rounds	1C	1,518	256	-	1,774	-		49,401	2,431	-	51,832	0.1	-
Skelp	2	6,710	-	-	6,710	0.1		106,395	-	-	106,395	0.2	0.2
Wire rods	3	64,809	900	347	66,056	1.1		648,146	11,654	3,629	663,429	1.2	1.3
TOTAL SEMI-FINISHED		221,603	47,930	2,915	272,448	4.4		2,477,821	455,210	36,050	2,969,081	5.3	5.1
Bars—Hot rolled (incl. light shapes)	14	453,167	112,453	3,350	568,970	9.1		* 4,343,410	* 1,019,311	40,471	* 5,403,192	9.6	10.4
Bars—Reinforcing	15	188,450	7	-	188,457	3.0		1,694,206	336	-	1,694,542	3.0	2.9
Bars—Cold finished	16	78,237	15,353	3,871	97,461	1.6		736,084	151,331	41,514	928,929	1.6	2.2
Tool steel	17	983	6,496	-	7,479	0.1		* 9,119	* 60,477	-	* 69,596	0.1	0.2
TOTAL BARS AND TOOL STEEL		720,837	134,309	7,221	862,367	13.8		6,782,819	1,231,455	81,985	8,096,259	14.3	15.7
Standard pipe	18	219,254	54	1	219,309	3.5		1,933,365	352	33	1,933,750	3.4	3.5
Oil country goods	19	194,749	33,753	-	228,502	3.7		1,754,177	288,945	-	2,043,122	3.6	3.1
Line pipe	20	376,311	-	-	376,311	6.0		2,907,643	23	-	2,907,666	5.2	4.0
Mechanical tubing	21	41,353	18,221	298	59,872	1.0		400,722	154,567	3,223	558,512	1.0	1.2
Pressure tubing	22	22,571	5,528	1,752	29,851	0.5		224,955	54,935	18,155	298,045	0.5	0.4
TOTAL PIPE AND TUBING		854,238	57,556	2,051	913,845	14.7		7,220,862	498,822	21,411	7,741,095	13.7	12.2
Wire—Drawn	23	195,679	2,852	1,840	200,371	3.2		1,766,961	30,151	* 19,384	* 1,816,496	3.2	3.7
Wire—Nails & staples	24	36,681	-	-	36,681	0.6		328,666	-	3	328,669	0.6	0.7
Wire—Barbed & twisted	25	2,959	-	-	2,959	-		49,038	-	1	49,039	0.1	0.1
Wire—Woven wire fence	26	6,657	-	-	6,657	0.1		164,530	-	-	164,530	0.3	0.4
Wire—Bale ties	27	3,595	-	-	3,595	0.1		42,640	-	-	42,640	0.1	0.1
TOTAL WIRE & WIRE PRODUCTS		245,571	2,852	1,840	250,263	4.0		2,351,835	30,151	* 19,388	* 2,401,374	4.3	5.0
Strip—Hot rolled	37	100,505	1,982	1,088	103,575	1.7		944,971	21,409	4,972	971,352	1.7	2.2
Strip—Cold rolled	38	78,596	1,783	15,174	95,553	1.5		660,235	12,889	*129,442	* 802,566	1.4	2.0
TOTAL SHEETS AND STRIP		1,804,525	62,837	27,831	1,895,193	30.4		16,373,302	649,147	*257,449	* 17,279,898	30.6	35.7
TOTAL SHIPMENTS (1957)		5,832,324	352,974	44,555	6,229,853	100.0	xxx	52,625,530	3,320,716	446,468	56,392,714	100.0	xxx
TOTAL — PRIOR YEAR (1956)		5,158,778	334,093	47,044	5,539,915	xxx		49,711,661	3,674,695	435,169	53,821,525	xxx	100.0

*Revised.

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Mechanical Blast Cleaning of Wire Rods

(*Continued from page* 1478)

shot blasting equipment and ordered a special unit. It was set up in a place where a pilot line could be operated without interfering with plant production. A place where sufficient data could be collected to layout a more complete installation.

★ ★ ★

Actual operaton started in May, 1955 with a pilot line consisting of a payoff reel, the special shot blasting machine and a wire drawing block for a re-coiler. One year later, the shot blasting machine was disassembled and the other equipment returned to its place in the production lines.

★ ★ ★

To borrow a phrase, this was a year of blood, sweat, and tears. Blood, from cut fingers — sweat, from operating in the hot summer months in close quarters — and tears, from all the times a test run ended in failure.

★ ★ ★

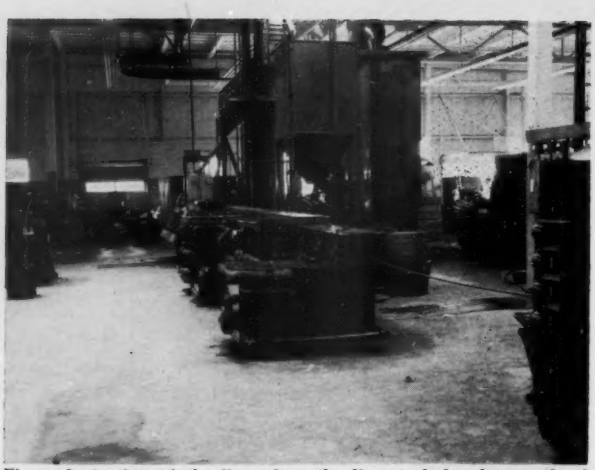

Figure 3—A view of the line where the lime tank has been replaced with a bonderite tank.

However, all was not in vain. We had data, pages of it, we had results, pieces of wire and boxes of sample bolts. **And,** we had a process—at least our cost department estimate had priced us into competition with more conventional methods.

★ ★ ★

We had also made the deadline for incorporation of the process in the new plant we were starting to build in Cleveland, Ohio.

★ ★ ★

There is no need to go into detail about getting a new process set up in a new plant ready for production. All the laboratory methods had to be translated into more rugged ways of doing a job. Stovepipes were replaced with 16 gauge steel and automobile rims used for

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looping rolls were translated into cast steel rolls with heavy tapered bearings.

* * *

Now to get down to the process. It's very simple—a payoff reel, a shot blasting machine, a lime or phosphate tank and a draw block. Rod starts at one end and wire is stripped from the block at the other. If you want it really simple, you put the payoff next to the draw block and run the rod around sheaves, make a U-turn and come back to where you started.

* * *

There is no question that the process can produce wire, tons of it. Experimentally we made about 70 tons. Since June of this year, operating only one line on one shift on small (smaller than 3/8) wire, we have drawn over 250 tons. Speeds of drawing are presently limited by our draw block capacity, but better than 300 ft./min. has been run regularly. Remember please, you high speed wire drawers, this is a single pass draw, around 20% to 25% reduction in area and the resultant wire must have a good lubricant coating for extrusion and cold heading. Others, namely Sheffield Steel in Kansas City, have made runs on .550 wire at speeds up to 250 ft./min. Drawing of bright wire has been done directly from the shot blasting machine thru a grease lubricant at speeds limited only by the draw block.

* * *

It would appear that this process is a completely satisfactory method of taking rod and in one continuous operation producing drawn wire that satisfies many of the requirements for cold drawn wire. It differs from many descaling processes in that the wire is clean and can be drawn bright or with sufficient lubricant coating for cold heading and extrusion.

* * *

Several pictures of the equipment in operation may give a better idea of the process than many words can do.

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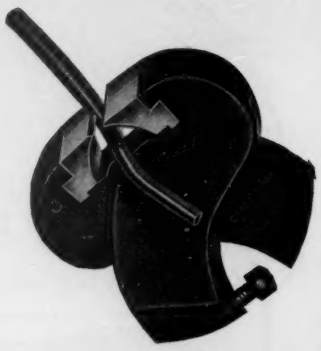

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Practical Slide Rule Method for Calculating Percentage Reduction in Area in Working and Testing of Rod and Wire

(*Continued from page* 1497)

assumption, though closer, still does not lead to the desired end diameter, .031 in. dia., of the wire. A third trial with an assumed 30 "P.D.H." is undertaken. The resulting intermediate die sizes, i.e., .0753, .0630, .0527, .0441, .0369, and .0309 lead closely to the anticipated end size.

★ ★ ★

Answer 5b. Wire of .090 in. dia. can be reduced to the given end size of .031 in. dia. by six holes with 30 "P.D.H."

VI. Slippage

The growing length of the stock in a multiple wire reducing machine is directly proportional to the percentage reduction in area. Therefore, this slide rule method is equally useful when drawing block diameters must be reckoned with. The finishing block must operate with a minimum of slippage of wire, in order to retain the surface finish of the final product.

★ ★ ★

Example 6. Wire of .210 in. dia. has to be drawn to .140 in. dia. using two blocks 17 in. and 24 in.

★ ★ ★

a) What is the minimum draft for the finishing pass?
b) What is the minimum first die size.
c) What slippage of wire vs. block will occur at the first block?

★ ★ ★

Solution 6a.

Push hairline to 17 on D;
draw 24 of C under the hairline;
opposite index B read 50 on A;
subtract .50 from 1.
"T.P.R.A." is 50 percent.

"D.H." $= 1 - \sqrt[2]{1-0.50} = 0.29$ (Eq. 4)

★ ★ ★

Answer 6a. The minimum draft of the finishing pass is 29 per cent

★ ★ ★

Solution 6b.

Subtract .29 from 1;
set index of B opposite 71 on A right;
opposite 140 of D read 166 on C.

★ ★ ★

Answer 6b. The minimum first

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die size is .166 in. dia.

★ ★ ★

Solution 6c.

Leave index of B opposite 71 on A right;
push hairline to 166 on D;
at the hairline read 197 on C.
The given starting size of the wire, however, is larger than .197 in. dia., namely .210 in. dia. In order to calculate the percentage of slippage at the first block:
Push hairline to 197 on D;
draw 210 of C under the hairline;
opposite index of B read 88 on A;
subtract .88 from 1.

★ ★ ★

Answer 6c. There will be a slippage of 12 per cent at the first block.

VII. Diameters of Step-cone Drawing Block

Finally, this slide rule method can also be employed to determine a sequence of step-cone drawing block diameters. As this seems more a problem of interest to the mechanical engineer and the processing engineer, it is here dealt with briefly.

★ ★ ★

Example 7. What are the diameters of a nine-block step-cone drawing block, when the final block is 20.1 in. and the first block is 7.95 in.?

★ ★ ★

Solution. Using the method shown in Example 5b, one finds after a few trials that the right index of B when opposite 79.2 on A right provides satisfactorily the intermediate diameters of the blocks on scale C opposite the smaller diameters on scale D in a series, conveniently found by pushing the hairline successively to the smaller diameters.

★ ★ ★

Answer. The diameters of the nine-block step-cone drawing block are: 20.1, 17.9, 15.9, 14.2, 12.6, 11.3, 10.0, 8.93, and 7.95 in. As often, they are to take 20.8 "P.D.H.," i.e., B&S gauge reducing system steps.

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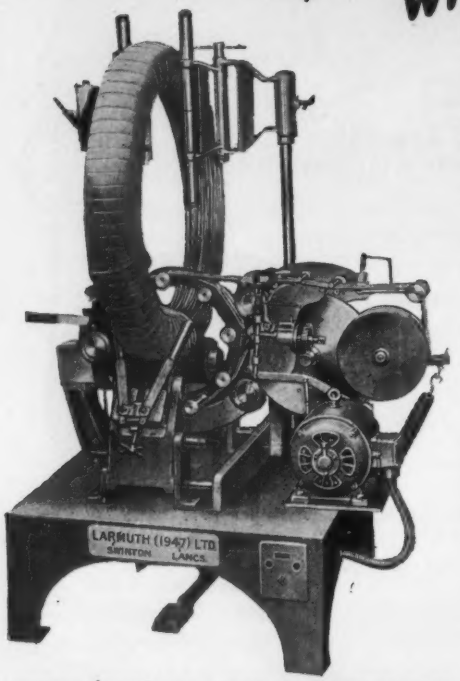

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portional to the length of the scales used. The common 10-inch slide rule gives result correct to within about 1 part in 1000, or one tenth of one per cent, which is sufficient for the practical purposes shown in Examples 1 to 6. In cases as Example 7 where at high speeds the diameters must be most accurate the slide rule result serves as a check.

Summary

Processing economy and the aim to obtain best physical properties in metals suggest continuous application of mathematics in metal drawing. Seemingly tedious and difficult wire drawing problems are quickly and easily solved by applying a described sequence of steps to an ordinary slide rule.

Acknowledgment

The writer is indebted to **Dean T. Stephen Crawford** for inspiring and encouraging this article. Thanks are due to my colleagues, **Dr. Donald Bradbury, Dr. Wesley C. Panuzio** and **Dr. Edward M. J. Pease** of the University of Rhode Island, whose suggestions contributed greatly to clarify the subject for presentation, and to **Mr. R. Turner,** Plant Manager of United Wire and Supply Corporation, Providence, R. I., for fruitful discussions of wire drawing problems.

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2. Crum, E. G., The Crum Calculator for Wire Drafting; 21, 221-223, 253-254, March, 1946.

Folder on Wire Spheroidizing

Lee Wilson Engineering Co., 20005 W. Lake Rd., Cleveland 16, Ohio, has issued a 4-page folder entitled "Spheroidizing at Its Finest." It illustrates and describes a high convection bell type furnace said to set new standards for this process in heat treating rod and wire coils. The folder is available for the asking.

Major Improvement in Wire Weaving Loom Disclosed by Screening Manufacturer

(*Continued from page* 1490)

screening. Aluminum is cheaper than bronze and resists corrosion almost as well. These three types of screening are all being manufactured today. The present order of popularity is: (1) electro-galvanized steel, (2) aluminum and (3) bronze; but the trend is toward aluminum.

★ ★ ★

One more change in mesh was made. During the last World War, the Army found itself in need of vast quantities of insect screening to keep out the bloodthirsty Anopheles Quadrimaculatus, the mosquito transmitter of malaria in the South Pacific. Was there any way to step up production?

★ ★ ★

Yes, there was. An 18 by 14 mesh could be woven faster than the prewar standard of 16 by 16. Screening had always been woven in square meshes, but in 1944 the Army was in a hurry. The industry was given its orders to change over. Rather dubiously, screen cloth manufacturers complied.

★ ★ ★

The industry has never gone back to the old square mesh. After the War, an exhaustive series of tests with live mosquitoes of many varieties was conducted by the University of Delaware and the University of Florida. These tests proved conclusively that the 18 by 14 screening does as good a job of keeping the buzzing bloodsuckers from your home as the prewar 16 by 16. Unless ordered for special purposes, all screening now is woven 18 by 14.

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The company has had relatively few changes in management. In a period of over 60 years, only two families, the DeWitts and the Roots, have controlled the business and only three persons have been in charge of plant operations —**F. R. Alvord,** who died in 1923, **Robert P. Turner,** retired in 1954, and presently **Stuart M. Jones,** vice-president.

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Buried Distribution for Telephone Circuits

(*Continued from page* 1484)

Referring now to the objectives anticipated in burying these distribution wires and cables, we can say that our studies indicate that the cost objectives may be achieved under favorable conditions. Anticipated reduced maintenance costs are apparently being achieved, although the experience has not been long enough to make this certain. In any event, the danger of damage by high winds and falling tree branches is eliminated where buried installations are in service.

* * *

The favorable results being obtained have tended to accelerate the burying of wires and cables. It has been estimated that 25,000 new homes may be so served during 1957. This is three to four times the number served last year. Such new developments as Elk Grove in the Chicago area will have all of the power and telephone distribution underground. This city of approximately 6,000 houses will have no utility poles and no outdoor radio or TV antennas rising above the level of the houses.

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A New High Speed Continuous Take-Up And Pay-Off System for Wires

(*Continued from page* 1494)

units have the advantage of interchangability.

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★ ★ ★

In spite of the fact that it was not necessary for our own purpose, tests have been made with success on annealing the wire in drums in an annealing furnace. This is important for factories not equipped with continuous annealers.

Color Dynamics for the Modern Wire Mill

(*Continued from page* 1487)

tions, assisted by **Raymond O. Hallberg,** General Superintendent and Secretary. Employees on various banks of machines were also consulted as to color preferences. Before its execution, the predominant color was a dull battleship gray. Now it all has a bright, cheerful new look.

★ ★ ★

"The over-all results," explained Mr. Hallberg, "is that color application has helped to reduce fatigue and eye strain. We all realize that mental depression among employees is easily brought about by drab, cheerless surroundings. The job gets tougher as the mental attitude of the worker gets worse. But it can all be changed with a few coatings of color applied at the right places."

The Edmands Company welcomes the Insulated Wire Industry to our new plant in Cranston, R. I.

Come and see our excellent facilities for designing and building wire machinery to our own or customer's design.

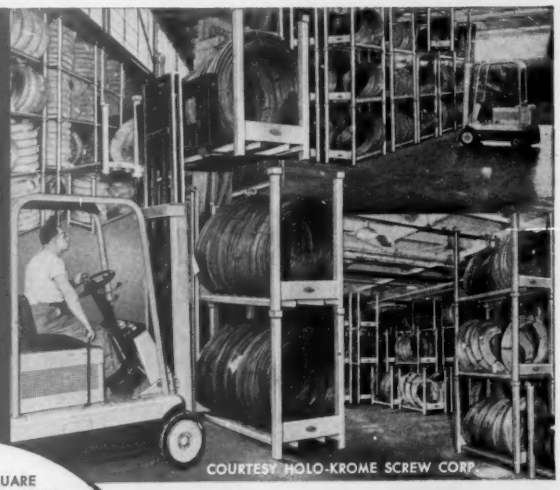
The machine tool equipment is modern and has been selected for the efficient machining of wire machinery components.

Our assembly floor is one hundred feet in length, is serviced with a crane over the whole area and is equipped with ample power for test running complete machines.

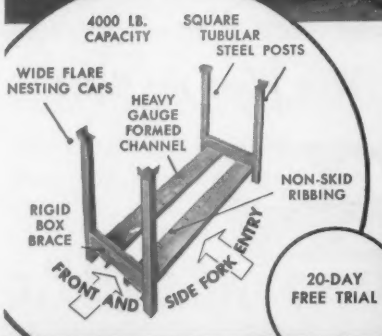
We would appreciate the opportunity of quoting on your requirements for twisting machines, cabling machines, take-ups or special machines.

THE EDMANDS CO. 860 WELLINGTON AVE. CRANSTON 10, R. I.

JARKE
PORTABLE
WIRE COIL RACKS



COURTESY HOLO-KROME SCREW CORP.



Solve Wire Coil Storage Problems

Makes handling and storing of unwieldy wire coils a simple one-man operation. Improves plant housekeeping, saves space, provides positive inventory control. Front and side fork entry permits closer stacking and greater maneuverability in narrow aisles. Saves time, labor, cuts costs. Standard and special sizes.

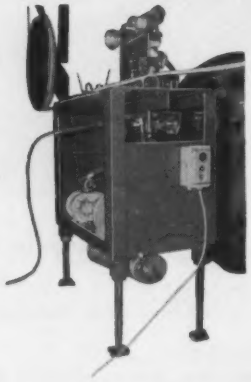
20-DAY FREE TRIAL

JARKE MANUFACTURING COMPANY

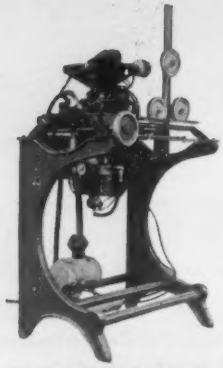
Send for Details
5407 Broadway
Chicago 40, Ill.

MODULAR STORAGE SYSTEMS FOR METAL INDUSTRY • STEELMOBILE

LABELING MACHINES for WIRE and CABLE



SE-300 SERVICE ENTRANCE LABELING MACHINE.
Designed for labeling Service Entrance Cable. Will apply a UL label every 20 feet. Fully automatic. Speed limited only by the speed of the wire.



FA-200 FLAG LABELER.
This machine has high operating efficiency—up to 3000 labels per hour. Used before an Artos Cutter, with speed governed by cutter. Completely automatic. Space available on labels for advertising.

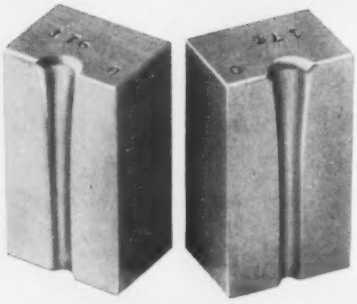
Write today for detailed information.

DEWYER, INC.

P.O. BOX 208
LIBERTYVILLE, ILLINOIS
Telephone: LI 2-2161

Sjogren POINTING DIES

SJOGREN Pointing Dies have proven themselves! Made from shock-resisting high grade steel they assure many hours of hard, continuous usage. Fit your swaging machines with these rugged, S & S Pointing Dies, made to order on your specifications, they guarantee you service.



SINCE S&S 1927

Used by Wire Men Who Want the Best!

Sjogren SINCE S&S 1927
TOOL & MACHINE CO., INC.

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

14 Sword St.
AUBURN, MASS.

From Hot-Rolled Rod to Finished Wire Through The Process of Mechanical Blast Cleaning

(*Continued from page* 1476)

From this data and from the operations described above, equipment designs have been developed covering additional process applications such as:

1. **Cleaning in line with a "Hoag" and cold header machine.**
2. **Cleaning in line with a bull block followed by a straightening and cut-off machine.**

★ ★ ★

We believe this process can be applied to nearly all rod and bar cleaning problems. Our large Demonstration Laboratory and our design engineers are at your disposal. We strongly suggest that you take advantage of these facilities to prove the savings possible through the use of Mechanical Blast Descaling.

New All-Purpose Vertical 4-Slide Machine Announced

The Torrington Manufacturing Co., Torrington, Conn., a major producer of wire forming equipment, has announced the availability of a new vertical four-slide machine, said to incorporate many advantages over the horizontal type.

★ ★ ★

Called the Verti-Slide, it is the result of over four years of development work. Two outstanding operating advantages are 1) superior visibility and accessibility of all parts, especially the tooling area and 2) reduced floor space. Set-up time and tooling costs are lowered, as all adjustments are made by one man from the front of the machine.

★ ★ ★

Other advantages are that the energy of the flywheel is available for jogging and the machine can be stopped instantly, since the clutch is between the cam shaft and the flywheel, which rotates constantly; safety has been increased; special attachments or slides can be used in place of regular slides; split-type cams are adjustable through 360°; parts are heat-treated for long life; and the

machine is quiet in operation and very accurate.

★ ★ ★

Full details may be secured from the manufacturer.

Establishes Canadian Division

The establishment of a Canadian Division by **Wheelabrator Corp.**, Mishawaka, Ind., has been announced by **Otto A. Pfaff**, president. The new plant is located in Scarborough, (Metropolitan Toronto), Ontario.

★ ★ ★

Wheelabrator has been active in the Canadian market for the last 12 years with Sales offices located in Toronto and Montreal. The Scarborough plant will permit expansion and improvement of services to the rapidly growing Canadian industry.

★ ★ ★

Robert A. Campbell, Canadian District Manager since 1946, is General Manager of the division. The Montreal office has been expanded to include a dust and fume control engineer.

Lubricant Literature

The R. H. Miller Company, Inc., Homer, New York, pioneer in the field of metal working lubrication and manufacturer of "Steelskin" Lubricants, has informative brochures that are available upon request:

"Metal Drawing Lubricants for Wire, Tubing and Sheet Steel"—This article summarizes the progress which has been made in metal-drawing lubrication and presents some practical suggestions on the selection and use of lubricants for the drawing of wire, tubing and sheet steel.

★ ★ ★

"Wire Drawing Lubricants for Mechanical Descaling"—Besides covering lubricants for mechanical descaling, regular wire lubricants for many end uses of wire are outlined in detail in this article.

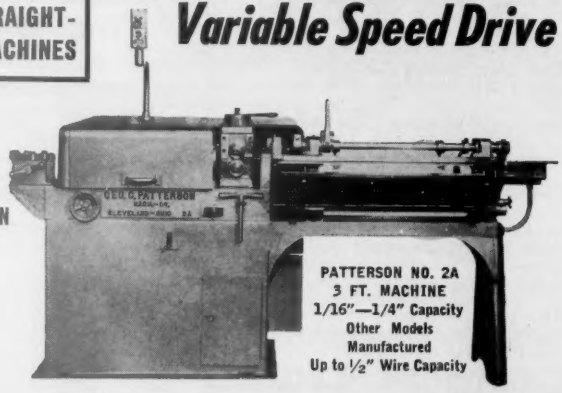
★ ★ ★

"Metal Drawing Lubricants" — Together with a brief history of the R. H. Miller Company, Inc., specific "STEELSKIN" Lubricants are recommended for particular operations in the steel industry and other metal fabricating industries.

GEO. C. PATTERSON
HI-SPEED
AUTOMATIC WIRE STRAIGHTENING & CUT-OFF MACHINES

Electrically Operated with Variable Speed Drive

- **MINIMUM COST**
- **MAXIMUM PRODUCTION**
- **ACCURATE LENGTHS**
- **NEW FEATURES**



Write for free literature on your requirements

THE GEO. C. PATTERSON MACHINE COMPANY
3409 TRUMBULL STREET
CLEVELAND 15, OHIO

PHONE: BROADWAY 1-1808

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FIRST QUALITY—PROPERLY-GRADED

DIAMOND POWDERS

Will give you maximum • • •

Value • Service • Economy

For this you pay a little more in first cost, but you save in faster work, in superior die finish and in better wire drawn. DANFORTH POWDERS are uniform in purity, quality, grain shape and accuracy of grading.

COMPLETE RECLAIMING SERVICE

The DANFORTH PROCESS of reclaiming produces powders that are *guaranteed* to be 99% or better pure.

Write today for information on diamond powders.

C. W. DANFORTH COMPANY

P. O. Box 448 Established in 1912 **Youngstown, Ohio**

Announcing

The Completely NEW Robert J. Emory SPOOLER

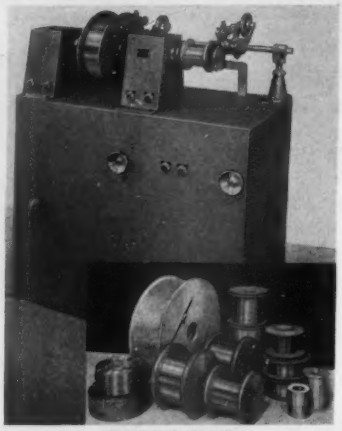
The New Model 1900-HVE Multi-Spindle SPOOLER, engineered to include the revolutionary U.S. Varidyne Power System, assures increased production, complete flexibility of adjustment, uniform wire tension and extremely close winding.

Each strand of wire lays parallel, with no overwinding or underwinding—and no tight or loose spaces. Each spindle is powered with a variable-speed AC motor, each of which can be stopped or started independently of the master power unit.

The 1900-HVE Spooler is a rigid, precision machine that will produce a uniform dense lay of wire consistently. It is completely adaptable to constant or changing demands. Adjustments can be made accurately with the spooler in operation and without tools. All controls are positive.

Your special requirements can be incorporated in the design.

You are invited to consult us on your wire spooling problems. Our engineering resources and 60 years of experience are at your service.



SPECIFICATIONS

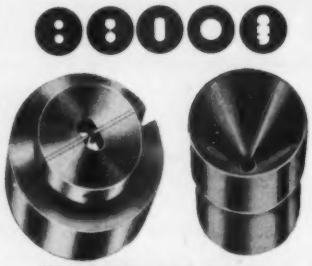
Size Range: .010" to .080" or heavier if soft, and many flat wire sizes. Max. Spool Size: 16" flange diam. Capacity: Usually 4 to 10 spindles.

ROBERT J. EMORY COMPANY

31 East Runyon Street Newark 5, N. J.

INSULATING DIES AND NOZZLES

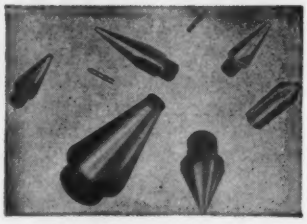
for EXTRA-HIGH ELECTRIC WIRE PRODUCTION



STEEL DIES—ALL SHAPES.

CARBIDE AND STEEL

Highest Quality Workmanship and Materials. Standard Types and Special.



CARBIDE EXTRUSION NOZZLES OR TIPS FOR ALL MACHINES.

BRIDGEPORT CARBIDE NOZZLES have phenomenally long life, will lower operating costs and reduce wire breakage.

BRIDGEPORT STEEL DIES are made in Round, Figure 8, Serrated, Tracer and other Special Shapes to your specifications. A newly designed Tru-Rip Die Assembly can be taken apart, cleaned, blades changed and reassembled quickly and easily. Made for 2 and 3 conductor wires to be coated in extrusion machines.

Write for folder or phone for information

WIRE TOOL DIVISION

BRIDGEPORT JIG BORING COMPANY

102 CENTRAL AVENUE, BRIDGEPORT, CONN. TEL.: FOREST 7-8473

Export Dept. ANDOVER INTERNATIONAL INC., 10 BRIDGE ST., NEW YORK 4, N. Y.
CABLE Address ANDONIK

LEADER IN HIGH PRODUCTION EXTRUSION TOOLS FOR ELECTRIC WIRE

Booklet on American Standards Association

More than 440 American cities have based regulatory ordinances on the two American Standard codes covering the installation of electrical equipment.

★ ★ ★

These are two of the 1687 reasons why it pays American industry to invest more in American Standards, according to a new booklet just published by the ASA.

★ ★ ★

The brochure's title is "1687 Reasons Why You and Your Company Should Support the American Standards Association." 1687 American Standards have been approved by ASA in almost every field of the American economy.

★ ★ ★

Without ASA codes, electrical products would not have the national free market that has made possible their mass production, mass distribution, low cost and high quality. It would cost an individual company perhaps $500,000 to develop two standards that it can buy from ASA for $4.50.

★ ★ ★

Copies of the 32-page booklet are available from the **American Standards Association, Inc.,** 70 East 45 St., New York 17, N. Y.

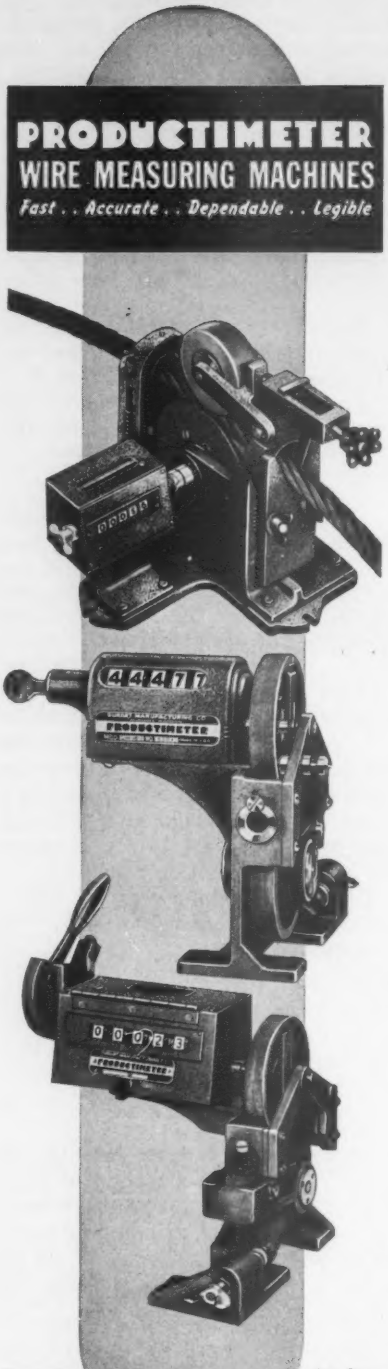
Spray Coating Process Protects Steel Against Molten Aluminum Attack

A method has been developed for the protection of steel and cast iron parts against attack by liquid aluminum, by coating these parts with chromium boride. Called the Borocote process, it uses chromium boride rod that is flame-sprayed in a new type of metal-spraying equipment, the Borocote Metallizer. The resulting coating on the surface completely prevents wetting of the coated steel or iron by the molten aluminum and has excellent oxidation resistance up to 1800° F.

★ ★ ★

The new process can be used for

PRODUCTIMETER
WIRE MEASURING MACHINES
Fast . . Accurate . . Dependable . . Legible



Productimeters measure all types of wire from .010 to 1½ inches in diameter . . . at speeds up to 5,000 feet per minute. They eliminate "guess-work" . . . insure profitable operation in your plant.

Send for Catalog No. 40

DURANT MFG. CO.
1918 N. Buffum St. Milwaukee 1, Wis.
18 Thurbers Ave. Providence 5, R. I.
Representatives in Principal Cities

PRODUCTIMETERS SINCE 1879 *Count Everything*

the protection of thermocouple tubes, construction parts to be inserted in the molten aluminum, heat exchangers and various applications in aluminum casting equipment.

* * *

Details can be obtained from the **Metallizing Company of America,** 3520 West Carroll Avenue, Chicago 24, Ill.

Wire Plant Expanded

The Brookfield Wire Company, Brookfield, Mass., manufacturers of round and shaped stainless and alloy steel wire in a wide range of sizes, held an Open House on July 20th to show their many friends the newly erected brick and concrete building recently completed to keep pace with the increasing demand for their products.

* * *

The first expansion project was made during the Korean emergency, making the plant three times as large as the original one built in 1948. This quadrupled their production. The present plant on Route 9 in West Brookfield provides 15,000 square feet of floor space and is equipped with many new machines for drawing intermediate and fine sizes of wire. The new facilities provide four times the capacity of those existing in 1955. Wire is drawn from purchased rod.

Bulletin on Wire for High Temp Fasteners

A Technical Data Sheet covering uses of new bolts and rivets of super alloys for high temperature applications is available without charge from **Techalloy Company, Inc.,** Rahns, Pa. High temperature applications outlined are for jet engines, airframes and guided missiles.

* * *

Technical Data Sheet gives performance characteristics of the various super alloys along with the new A.M.S. specifications covering them. The new overhauled centerless ground wire and its use for cold headed aircraft fastenings is described. Overhauled centerless

START SAVING in your Die Finishing Rooms

Double your Refinished Tungsten Carbide Die Production

CUT labor costs ½ with the New type "M" automatic

DYKREX
"IT CORRECTS THE DIE"

Polishing Machine

It's factory assembled— just plug it in to nearest electric outlet.

ROOS TOOL & MFG. DIVISION
Dykrex Corporation of America
manufacturers of
Wire Die Finishing Machinery
33 Bloomfield Avenue
Newark 4, N. J.
Phone: Pilgrim 4-1500
Western Union
Teletype Service
QAB-WUX—Montclair, N. J.

The Standard of the Wire Industry

ground wire is now available in Monel, K-Monel, Inconel, Inconel X and Nickel. Also mentioned is the use of high temperature super alloy bolts and rivets in the new NCAA four-stage guided missile which travels at speeds over 7,000 miles per hour.

New Wire Machinery Catalog

Sjogren Tool and Machine Co., 14 Sword St., Auburn, Mass., has published a new catalog in a loose-leaf binder for permanent filing, covering the principal types of equipment manufactured for the wire industry.

* * *

The products illustrated and described are: Wire pullers, wedge grips, cage rollers, swaging hammers, painting dies, jaws for all makes of grips, pullers and testing machines, tensile testing machinery, wire spoolers, single and multiple spindle take-ups, straightening and cutting machines and cast killers.

* * *

In the back is included a number of pages for engineering sketches of special equipment. The company designs and fabricates special machinery to order.

* * *

Copies of this catalog will be sent upon letterhead request to the company.

Davis-Standard Announces Additions to Line

Davis-Standard, Div. of **Franklin Research Corp.**, Mystic, Conn., has announced two important additions to its line of wire insulating equipment.

* * *

Two new king-size reel pay-offs and take-ups that take reels up to 10 feet in diameter and weighing up to 30 tons. These are made in two sizes. Both are the shaftless type, loading at floor level without ramps. Dual screw lifts raise reels to operating position.

* * *

The other addition is a heavy-duty caterpillar capstan featuring a tread that grips the cable without deforming it, regardless of diameter, which can run from 5/16" to 5".

* * *

A new tread material, combining resiliency, high coefficient of friction and abrasion resistance provides an unusual gripping surface. Has a pulling capacity of up to 5000 lbs., with speeds of from 100 to 300 or more ft. per min.

* * *

Full details will be supplied by the manufacturer upon request.

Bulletin on Acid and Alkali-Proof Products

A 12-page bulletin describing their complete line of cements, linings and coatings for acid and alkali applications has been issued by the **Electro Chemical Engineer-**

Cut Your Product Cost . . .

Stop struggling with wire worries. There's a Continental wire to help cut products costs — to add sales appeal. Let us know about your problem . . . Let Continental's helpful wire service work for you.

CONTINENTAL STEEL CORP. STEEL CONTINENTAL WIRE KOKOMO, IND.

*Trade Mark Reg. U. S. Pat. Off.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES - KOKOMO, INDIANA

PRODUCERS OF: Manufacturers' Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special shaped wire. Also Continental Chain Link Fence, and other products.

FOR WET DRAWING AND CLEANING COMPOUNDS

SPECIFY

PERMAG

For more than 33 years, Magnuson Products Corporation has helped solve difficult wire drawing and cleaning problems at considerable savings.

Write, wire or phone today and find out how Magnuson can help you expedite production.

MAGNUSON PRODUCTS CORPORATION

50 COURT ST., BROOKLYN 1, N. Y. In Canada: Canadian PERMAG Products, Ltd., Montreal

MUSIC WIRE and SPECIAL WIRES

Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .3437"
45 sizes Bright Tinned, .003" to .125"
Aluminum—Annealed—Belt Lacing—Brass, Soft and Spring—Copper, Bare and Tinned
Coppered Steel Spring—Galvanized—Tinned
Monel—Nickel Silver—Pure Soft Nickel—Oil Tempered, Steel Spring, Black Finish
Phosphor Bronze, Spring Temper—Pure Iron Wire—Resistance Wire,
Hoskins Chromel "A"—Stainless, Soft and Spring Temper—Tag Wire, 1000 in an Envelope—Florist Wire—Spooled and Coiled, 1/4-1/2-1-5#
Wires Straightened and Cut to length—Small Gauges—Small orders our specialty
Wires and Strands for the fishermen. Trolling Wires, Copper-Monel-Stainless.
Leader Wires, "Wilstabrite" Stainless and "Silverbrite" Music.

THE MALIN & COMPANY

2514 Vestry Ave. Established in 1884 Cleveland 13, Ohio

ing & Manufacturing Co., 750 Broad St., Emmaus, Pa.

★ ★ ★

The applications cover tanks, floors, sewers, vents, hoods, fans, pumps, impellers and other miscellaneous equipment and range from brick and cements to impervious membranes for coating, lining, etc. Tables of physical properties and quantities required are given for each product.

★ ★ ★

A copy of this bulletin—No. G-57—will be mailed to interested parties upon request.

New Bulletin Issued by Waterbury Farrel

The **Waterbury Farrel Foundry and Machine Co.**, Wire Mill Div., Waterbury, Conn., has issued a bulletin describing its No. 2 Intermediate, upright, core-type wire drawing machines for non-ferrous wire. The machines are made in 8 and 14 die types for copper, aluminum and brass, and embody many new features. Write for circular 945-W.

★ ★ ★

The W. F. Cold Heading Equipment Div. also has a new bulletin on the company's complete line of open die rod headers, designed to take long rods that cannot be handled on automatic rod headers. Full details are given for each model. Write for bulletin No. 866-A-3.

New Wire and Cable Manual Published by Rome Cable

The second edition of the Rome Cable Manual of Technical Information, a 393-page "Bible" of the wire and cable industry first published ten years ago, has just been issued by **Rome Cable Corporation**, Rome, N. Y. Particular emphasis has been placed on the newest materials and methods in the field. 130 pages have been added.

★ ★ ★

The manual is divided into eight sections: (1) Wire and Cable Technical Tables, (2) Wire and Power Cable Engineering Calculations and Data, (3) Communication Frequency Data and Calculations, (4) National Electrical Code Data, (5) Properties of Metals, (6) General Technical Information, (7) Conversion Tables and (8) Cable Installation Practices. An alphabetical index follows.

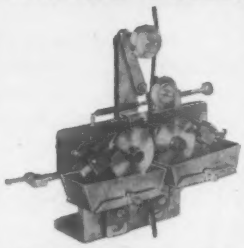
★ ★ ★

The manual will be distributed mainly by Rome Cable sales offices and resident salesmen. Foreign distribution and all sales (it's $4.50 a copy plus 12 cents postage) will be handled directly from Rome.

Rockbestos Planning New Plant

The purchase of thirty-seven acres in North Haven as a site for a plant and office building was announced by **Albert S. Redway**, president of the **Rockbestos Prod-**

MARKING WHEELS and MACHINES for ELECTRIC WIRE



Gillies Engraved Concave Wheels are widely used for printing on rubber or plastic coated wire, for code or manufacturer identification. Machines print on ONE or BOTH SIDES in large legible letters. Wheels adaptable to any machine or we will supply machines. Wheels, shafts, ink pans and all accessories readily removable for quick and easy cleaning. Wheels of TOOL STEEL, HARDENED to Rockwell test 61-64 and HARD CHROME PLATED.

Send for samples of wire and prices on wheels and equipment

DUNCAN M. GILLIES CO., INC. Post Office Box 181 WEST BOYLSTON, MASS.

Telephone: West Boylston TE 5-4445

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RUST PREVENTATIVES LUBRICANTS

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LANOLIN WOOL GREASE DEGRAS

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Give the longest flex life

In Cord Sets and Loudspeakers,

Electronic, Vibrating and Moving Devices

Tinsel May Solve Your Problem

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Est. 1871

25 CANAL STREET Tel.: National 3-3336 WINDSOR LOCKS, CONN.

HIGH TENSILE
AND
MILD STEEL WIRES

SPECIALITIES:
HIGH STRAIN ROPE,
CABLE, MATTRESS,
AND SPRING WIRE

WESTEBBE & WEISPFENNIG
WIRE WORKS
UNNA (Westf. Germany)

THE NELSON COMPANY
STANDARD OIL BLDG., BALTIMORE 2, MD.

WOOD
REELS!
10" TO 120" IN DIAMETER

SET-UP
or
KNOCKED DOWN

QUICK DELIVERIES

SPECIALIZING IN WIRE ROPE
REELS AND INEXPENSIVE
"ONE-TRIP" REELS
FOR CABLE

Thirty years of experience in
quality woodworking.

ucts Corp., New Haven, Conn., manufacturers of electrical wires and cables.

* * *

The land is located on the east side of Middletown and Quinnipiac Aves., North Haven, approximately three miles from the present location in New Haven at the corner of Nicoll Street and Mitchell Drive.

Giant Turks Head Forms Special Shapes

The Turks Head, product of **The Fenn Manufacturing Company,** takes on increasingly important roles in the forming of special shapes from wire and rod with a large model built for one of the nation's leading metallurgical research organizations.

* * *

The Turks Head may be compared to an adjustable draw die, but differs in that it is infinitely adjustable within its limiting dimensions. It operates on the rolling mill principle and imparts the same qualities to the metal as a rolling mill. The basic difference is in the number and arrangement of rolls. This large, extremely heavy duty Model 121 Fenn Turks Head can be used for shaping wire and rod sections up to 2" in diameter.

* * *

For detailed information write John Charpentier, sales manager, The Fenn Manufacturing Company, Fenn Road, Newington, Conn.

Union Wire Rope Joins Armco

Armco Steel Corporation announced plans to acquire the business and assets of **Union Wire Rope Corporation,** Kansas City, Mo., according to an announcement made on November 5th by R. L. Gray, Armco's president.

* * *

A new subsidiary corporation having the same name will be organized to operate the business, which will be continued with the same policies and personnel.

For
WIRE DRAWING
Warner
BELL-MINE
LIME
PRODUCTS
Strict laboratory
control assures
uniform quality
Pulverized Quick Lime
Hydrated Lime
Pebble Lime
WARNER COMPANY
Sales Offices
BELLEFONTE PHILADELPHIA
PITTSBURGH NEW YORK

UP GOES METAL-CUTTING OUTPUT
DOWN GO LABOR COSTS!

— WHEN YOU USE THE NEW
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For PRODUCTIVE CUTTING of HARD BOLTS, SPRING WIRE, RODS, CHAIN, BARS, WIRE ROPE and CABLE.

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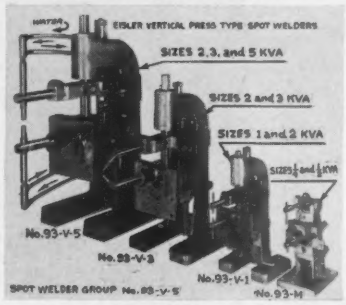

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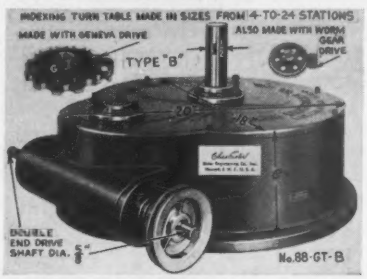
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Progress in Vertical Rod Storage

(*Continued from page* 1481)

efficiency.

★ ★ ★

Equipment is available which will band individual coils at the rod cooling conveyor with flat bands as fast as necessary with less labor. Banding the individual coil will compact it as much as 50%, or a number of coils can be banded into a unit load of 4000 lbs., either of which can be stored vertically.

★ ★ ★

Recently a press has been designed experimentally which initial tests have indicated has possibilities for compacting coils into unit loads of 3600 lbs. to 4000 lbs., using wire ties. This press can be installed at a convenient point under the rod conveyor, coils dropped into it, compacted and tied. Some additional work may be necessary to complete full development, but it does present a solution to packaging unit loads of rod.

★ ★ ★

The following figures illustrate the vertical storage system in the Cleveland bolt plant.

★ ★ ★

Figure #1 shows an incoming car in the rod warehouse, with some coils banded into unit loads, others banded separately by loose ties.

★ ★ ★

Figure #2 shows hook digging into coils.

★ ★ ★

Figure #3 shows pin in coils and expanding hook preparatory to lifting load out of car.

★ ★ ★

Figure #4 lifting a 3600# load, hook expanded.

★ ★ ★

Figure #5 hook has been rotated into vertical position, lowered into well and upper member of hook opens like a jack knife so it can be lowered into well without interferring with vertical pipe stanchions.

★ ★ ★

Figure #6 shows general view

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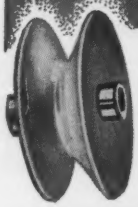

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of present storage area for 1650 tons of rod. Note the comparison as far as tonnage stored, with rods stored horizontally adjacent to vertical storage.

★ ★ ★

Figure #7 unloading tracks for horizontal storage system in the Steel Company of Canada plant. Note coils are compacted into 4000 lb. loads.

★ ★ ★

Figure #8 general view of Steel Company of Canada warehouse with horizontal storage. As stated previously, 8500 tons can be stored horizontally, and 25,000 tons vertically, with complete separation of rod categories. Incidentally, this crane has been designed so that later on the vertical type hook and trolley can be installed when experimental work on compacting is completed.

★ ★ ★

Figure #9 showing the advantages of proper development of

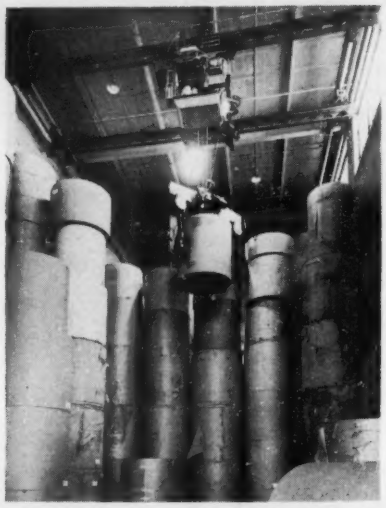

Fig. 9 • • • • • • • • • •

handling equipment in a paper plant. Rolls weighing 6000 lbs. are stored 42′ high, and are steel banded.

★ ★ ★

Figure #10 storage of baled pulp by conventional method which might be compared with present day storage in most rod mills.

★ ★ ★

Figure #11 showing what is possible with proper design of han-

Fig. 10 * * * * * * * *

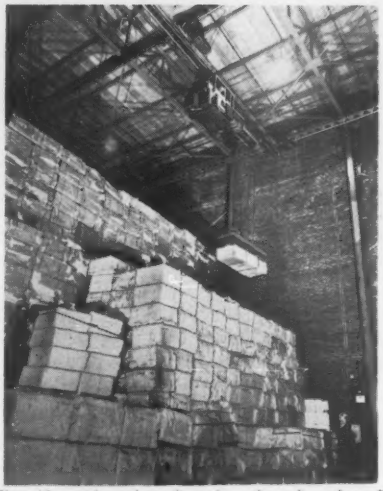

Fig. 11 * * * * * * * *

dling equipment, reducing cost of handling and increasing storage in the area.

★ ★ ★

To summarize, vertical storage aids in maintaining an accurate inventory and location of rod in the warehouse, decreases initial investment in handling equipment and warehouse cost, increases storage capacity regardless of whether common products or many sizes, heats and alloys are stored, and as one wire mill executive humorously remarked, "clears out storage areas where rod has been stored horizontally and left since 1890."

Develops Method of Handling and Storing PVC Resins

A new, economical way to handle polyvinyl chloride resins, largest volume plastic resin produced today, has been proven by months of actual field use of three Sealdbulk material handling systems manufactured and installed by **United States Rubber Co.**, 1230 Avenue of the Americas, New York 20, N. Y.

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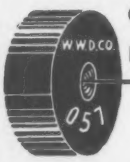

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Releases New Die Catalog

Firth Sterling Inc. announces a new catalog covering their line of Firthaloy dies and machinery and Diecarb perforators.

★ ★ ★

The products covered in the catalog are square and hexagon shape drawing dies; round wire, bar, and tube drawing dies; rough mandrel nibs; rough cored heading die nibs; nail and tack tooling inserts; barbing laps; straight and button head perforators; wire puller jaw inserts; and die finishing equipment.

★ ★ ★

Photographs are included throughout, as well as specifications and price lists. For a copy, please write the company at 3113 Forbes St., Pittsburgh 30, Pa.

Conversion Tables for Titanium Wire

A helpful reference work, "Conversion Table for Titanium Wire and Rod," has been published by **Johnston & Funk Titanium Corp.** The tables convert at-a-glance, titanium wire diameter sizes (0.002 to 0.200) to lineal feet per pound; and titanium round and square bar stock (1/16 to ¾-inch) to pounds per lineal foot. Copies of the conversion tables are available from Johnston & Funk Titanium Corp., W. Kemrow Ave., Wooster, Ohio.

New Bakelite Plant Opens

Production facilities for Bakelite polyethylene resins will be markedly increased with the completion of a newly-authorized plant at Whiting, Ind., it is announced by **Morse G. Dial,** President of **Union Carbide Corporation.**

★ ★ ★

This new high pressure polyethylene plant, with a rated annual capacity of 72,000,000 pounds, will raise Union Carbide's total rated annual production capacity to more than 375,000,000. The new Whiting plant raises the total of Union Carbide plants involved in the production and compounding of Bakelite polyethylene resins to nine.

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Copperweld Steel and Superior Steel Announce Merger

A plan to merge **Superior Steel Corporation** with **Copperweld Steel Company** was agreed on "in principle" in August by directors of both companies. The merger would be effected by the issue of ¾ths of one share of Copperweld common stock in exchange for each share of Superior common stock.

* * *

In a joint announcement, **Frank R. S. Kaplan,** Board Chairman and **James M. Darbaker,** President of Copperweld and **Carl I. Collins,** President of Superior, said that no changes in personnel are contemplated. The business conducted by Superior will be continued after the merger as the Superior Steel Division of Copperweld with Mr. Collins as Vice President in charge of that Division.

* * *

The facilities of the merging companies complement each other; and together with the facilities recently installed by Copperweld at its Warren, Ohio Steel Division will provide an added diversification of both products and markets.

Colloidal Dispersions for Industry

Acheson Colloids Company, Port Huron, Mich., has issued a newly-revised four-page bulletin, "'dag' Dispersions for Industry," listing colloidal and semi-colloidal dispersions of graphite, molybdenum disulphide, mica, vermiculite, iron oxide, acetylene black, and copper. Carriers and diluents are given for each product, along with typical applications and important physical data. The bulletin includes five entirely new 'dag' dispersions, recently added to the line.

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Carpenter Buys New England Mill

Frank R. Palmer, President of the **Carpenter Steel Co.,** Reading, Pa., has announced the purchase of the **Northeastern Steel Corp.,** Bridgeport, Conn., which, as a subsidiary, will hereafter be known as **Carpenter Steel of New England, Inc.**

★ ★ ★

Officers of the new corporation are **John Moxon,** Executive Vice President; **Arlington A. Britton, Jr.,** Vice President—Production; **H. Sturgis Potter,** Vice President—Sales; **Dr. Carl B. Post,** Vice President and Technical Director; and **Willard E. Roberts,** Secretary-Treasurer. Mr. Palmer, President of the new company, will also continue as chief executive officer of the present firm.

★ ★ ★

The company has been a producer of stainless steel bars, rods and wire.

Chase Brass Sells Cold Heading Business

Announcement by **Chase Brass & Copper Company** of the sale of the entire cold heading department of the Waterbury Manufacturing Company division to the **Connecticut Screw & Rivet Company,** Waterbury, Conn., and its affiliate company, **Anchor Fastener, Inc.,** with plants at Waterbury and Cleveland, was made by **Glenn P. Bakken,** president of Chase.

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a) Cable Design Engineer: Experienced in portable cords and cables, 600 volt to 15 KV preferred. Capable of heading present dept.

b) Rubber Chemist: Experience in extrusions preferred. Wire experience not essential. Good academic background and several years practical knowledge of rubber and plastics.

Send resume and your requirements to:

"Factory Manager"

Western Insulated Wire Co.

2425 E. 30th Street, Los Angeles 58, Calif.

FOR SALE

#3 Baird 4 slide machine 1950 Model Factory motorized 220/440 volts. Oil pan and pump. Now tooled for flat strip ferrules. Excellent condition

Reply to Box 930

WIRE & WIRE PRODUCTS

Stamford Conn.

EXTRUDER OPERATORS and SUPERVISOR

Experienced in extruding vinyl and nylon primaries, rubber, neoprene and vinyl jackets. Ideal working conditions in southern manufacturing plant.

Forward resume to: Box 929

WIRE AND WIRE PRODUCTS

Stamford Conn.

The purchase includes all facilities, such as dies, tools, prints and other information necessary to the production of cold headed products formerly made by the Chase division.

New "Teflon"* Tape with Color Stripes

Production of the first commercially-available, unsintered "Teflon" tape with color stripes is announced by **Bonny Manufacturing Corp.**, Auburndale 66, Mass.

★ ★ ★

The striped tape, available in widths of ¼" to 1", can be provided in any specified color. Uniformity of the laminated stripes is precisely controlled.

★ ★ ★

Principal use for the new product will be the insulation of wire and electronic parts that require the electrical properties of "Teflon", combined with a need for color identification. The new "Bonnytape" is being used as a wire insulating material, applied in a single operation.

★ ★ ★

A color specification sketch pad, showing how the tape can be ordered to meet individual requirements, is available from the company.

* duPont trade name.

Catalog on Stanat Line

Rolling mills, gang slitters, wire flattening lines, roller levelers, and related metal processing machines are described in Publication 1057, a new, 16 page two-color brochure published by **Stanat Manufacturing Co.** The publication features photos depicting numerous applications, including several interesting field installations. Views of the company's new plant and facilities are also shown. Copies are available from the company, 500 Shames Drive, Westbury, L. I., N. Y.

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For more complete information, consult the annual Wire and Wire Products Buyers' Guide.
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Amplex Corporation, West Hartford, Conn.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Norton Co., Worcester, Mass.

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(See Inhibitors, Pickling)

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The Louis Allis Company, Milwaukee, Wisc.

ANNEALING MACHINES — Electric Resistance
Synero Machine Co., Perth Amboy, N. J.

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Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

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(See OVENS—Rod Bakers)

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Acrometal Products, Inc., Minneapolis, Minn.
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Mossberg Pressed Steel Corp., Attleboro, Mass.
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Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

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United States Borax & Chemical Corp., Pacific Coast Borax Co. Div., New York, N. Y.

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Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
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Bartell Machine-Tool Corporation, Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Davis Electric Co., Wallingford, Conn.
Entwistle Manufacturing Corporation, Providence, R. I.
Litzler, C. A. Co., Inc., Cleveland, Ohio

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New England Butt Co., Providence, R. I.
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Oxy-Catalyst, Inc., Industrial Div., Wayne, Pa.

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American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
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Miller, R. H., Co., Inc., Homer, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
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COMPOUNDS—Rust Preventing
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United States Borax & Chemical Corp., Pacific Coast Borax Co. Div., New York, N. Y.

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(See DRUMS—Wire Packaging)

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Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

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Kelly Wire Die Corp., New York, N. Y.
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Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

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Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Diamond Dust Reclaiming Co., Detroit, Michigan
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Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

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Metal Carbides Corporation, Youngstown, Ohio
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Carbide, Tungsten & Tantalum
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Boulin, Victor J., Inc., New York, N. Y.
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Indiana Wire Die Co., Fort Wayne, Ind.
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Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y
Universal Wire Die Co., Cranford, N. J.
Vascoloy-Ramet Corp., Waukegan, Ill.
Wayne Wire Die Co., Hillside, N. J.

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Firth Sterling, Inc., Pittsburgh, Pa.
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Kelloy Corporation, New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit
Vascoloy-Ramet Corp., Waukegan, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Ft. Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
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Hoosier Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

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Hoosier Wire Die, Inc., Ft. Wayne, Ind.

DIES DIAMOND—Reversible
National Wire Die Co., Inc., New York, N. Y.

DIES—Extrusion
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Firth Sterling, Inc., Pittsburgh, Pa.
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Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Polishing, Asbestos Wire
Beard Machine Co., York, Pa.

DIES—Repairs & Re-Cutting
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Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
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Hoosier Wire Die, Inc., Ft. Wayne, Ind.
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Kelly Wire Die Corp., New York, N. Y.
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New England Wire Die Co., Worcester, Mass.
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Universal Wire Die Co., Cranford, N. J.
Vascoloy-Ramet Corp., Waukegan, Ill.
Wayne Wire Die Co., Hillside, N. J.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Hoosier Wire Die., Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., Waukegan, Ill.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRIVES—Electric, Adjustable Speed
Allis, The Louis Co., Milwaukee, Wisc.

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Hubbard Spool Company, Garrett, Ind.

DRUMS & TRAVERSES—For Cable Reels
Hubbard Spool Co., Garrett, Ind.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

DRYING EQUIPMENT—
Carl Mayer Corp., The, Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

ELECTRONIC PROCESS CONTROL DEVICES—
Winstrom, Northampton, Mass.

ENGINEERS—Consulting
Bartell Machine-Tool Corporation, Rome, N. Y.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FREQUENCY CHANGERS—
The Louis Allis Company, Milwaukee, Wisc.

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Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

FURNACES—Galvanizing Equipment
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Company, Philadelphia, Pa.
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

FURNACES—Resisting Heating, Strand
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

FURNACES—Salt Bath
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio

FURNACES—Strand Annealing
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Illinois

GAUGES—Electronic, for Springs
Winstrom, Northampton, Mass.

GAUGES—Wire Diameter, Continuous
Industrial Gauges Corporation, West Englewood, N. J.

GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)

GEARMOTORS—
The Louis Allis Company, Milwaukee, Wisc.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—For Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Aikali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INKS—Printing, for Insulated Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.

INSULATING MATERIALS —
Bakelite Company Div. of Union Carbon & Carbide Corp., New York, N. Y.
Blane Corporation, The, Canton, Mass.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
General Electric Company, Alkanex Wire Enamel Dept., Schenectady, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

INSULATING MATERIALS—Paper (For Electric Wire Cable)
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.

LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The. Philadelphia and Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Company, Harrison, N. J.
Rome Soap Mfg. Co., Rome, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.
Wafios, Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Bobbin Winders
Cedar West Tool Company, Inc., New York, N. Y.

MACHINERY—Braiding
New England Butt Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)

MACHINERY—Centerless Grinding & Polishing
American Laubscher Corporation, New York, N. Y.

MACHINERY—Chain Making
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Closing Rope
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling & Rewinding Steel Strip
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Herborn, Maschinenfabrik, Herborn, Germany
Morgardshammer Mek Verstads A. B., Morgardshammer, Sweden.
National Mach'y Exch (Used), New York
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn
Patterson Machine, Geo. C., Co., Cleveland, Ohio

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.
Herborn, Maschinenfabrik, Herborn, Germany

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Metallurgical Products Dept. of General Electric Co., Detroit
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven, Company, Detroit, Mich.

MACHINERY—Extruding
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.

MACHINERY—Flat Wire
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming Wire
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios Maschinenfabrik, Reutlingen, Wurtt, Germany

MACHINERY—Galvanizing Wire
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

MACHINERY—Gang Slitting
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Mfg. Co., Wallingford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Hydraulic
Manco Mfg. Co., Bradley, Illinois

MACHINERY—Insulating Wire
American Insulating Mach'y Co., Phila., Pa.
Beard Machine Co., York, Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Labeling Electric Wire
Dewyer, Inc., Libertyville, Ill.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia
Cook Mfg. Co., The, Paterson, N. J.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Cedar West Tool Company, Inc., New York, N. Y.
E. V. G., Richard Kleinhans, New York, N. Y.
Maschinen & Stahl A. G., c/o Richard Kleinhans, Zurich, Switzerland
Wafios Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg Co., Milwaukee, Wis.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N. Y.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Packaging Wire
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Godderidge Ste., Houilles (Seine-et-Oise), France

MACHINERY—Plating
Hodge Bros. Machine Shop, Ossining, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Pointing
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York,
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Polishing Asbestos Wire
Beard Machine Co., York, Pa.

MACHINERY—Printing on Electric Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., Boylston, Mass.

MACHINERY—Re-Spooling
Bartell Machine-Tool Corporation, Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Industrial Winding Machinery Co., New York, N. Y.
National Mach'y Exch. (Used), New York N. Y.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Rod Mill
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Company, Cleveland, Ohio
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Royle, John & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Scrubbing, Steel Strip
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Serving
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

MACHINERY—Slitting Metal
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Splicing (Strip)
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Staple
Nilson, A. H. Machine Co., Shelton, Conn.
Wafios, Maschinenfabrik, Reutlingen, Wurtt., Germany

MACHINERY—Straightening & Cutting
Breitenbach, Wilhelm, Unna, Germany
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Patterson Machine, Geo. C., Co., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening (Strip Leveling)
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Stranding
Bartell Machine-Tool Corporation, Rome, N. Y.
Godderidge Ste., Houilles, (Seine-et-Oise), France
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
American Insulating Mach'y Co., Phila., Pa.
Breitenbach, Wilhelm, Unna, Germany
Colbourne Machine Company, Winsted, Conn.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing Magnet Wire Coatings for Pin Holes
Federal Mfg. Co., Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.

MACHINERY—Testing, Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Bartell Machine-Tool Corporation, Rome, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Godderidge Ste., Houilles (Seine-et-Oise), France
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—Welded Wire Mesh
E. V. G., Richard Kleinhans, New York, N. Y
Maschinen & Stahl A. G., c/o Richard Kleinhans, Zurich, Switzerland
Manco Mfg. Co., Bradley, Illinois
National Electric Welding Machines Co., Bay City, Michigan
Schlatter, H. A., Ltd., Zurich, Switzerland

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot and Machinery—Welding Wire Fabrics)

MACHINERY—Winding Wire
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Federal Manufacturing Company, Wallingford, Conn.
Industrial Winding Machinery Co., New York, N. Y.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
Breitenbach, Wilhelm, Unna, Germany
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Federal Mfg. Co., Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Morgan Construction Co., Worcester, Mass.
Morgardshammer Mek Verstads AB, Morgardshammer, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Wire Forming
National Mach'y Exch. (Used), New York, N. Y.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Nilson, A. H. Machine Co., Shelton, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Larmuth (1947) Ltd., Swinton, England
Terkelsen Machine Co., Boston, Mass.

MANDRELS—Extrusion
Bartell Machine-Tool Corporation, Rome, N. Y.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MOTORS—Electric, A.C. — D.C.
The Louis Allis Company, Milwaukee, Wisc.

NAIL TOOLING—Tungsten Carbide
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Brothers, Inc., Cortland, N. Y.

NIPPERS—Wire Cutting
Robinson, M. W. Co., Rockfall, Conn.

NOZZLES—For Extruding Machines
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

OVENS—Cable Lacquering and Enameling
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

OVENS—Rod Bakers
Carl Mayer Corp., The, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl Mayer Corp., The, Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio

PAILS—Packaging
(See Drums—Wire Packaging)

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAPER—Creped Wrapping
Arkell Safety Bag Company, New York, N. Y.
National Waterproof Papers, Inc., Beverly, N. J.
Rinkle, Krinkle Paper Co., Inc., Boston, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Arkell Safety Bag Company, New York, N. Y.
National Waterproof Papers, Inc., Beverly, N. J.
Rinkle, Krinkle Paper Co., Inc., Boston, Mass.
Terkelsen Machine Co., Boston, Mass.

PAPER—Insulating
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

PATENT—ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PLASTICIZERS—
Monsanto Chemical Company, Plastics Division, St. Louis, Mo.
Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.

PLASTICS COMPOUNDING—Custom
Plandex Corporation, Downingtown, Pa.

PLASTICS—for Wire Insulation
Bakelite Company Div. of Union Carbon & Carbide Corporation, New York, N. Y.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plandex Corporation, Downingtown, Pa.
Shawinigan Resins Corporation, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

PRINTING WHEELS—for Electric Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gillies, Duncan M. Co., Inc. Boylston, Mass.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

PUMPS—Molten Metal
Fisher Associates, New York, N. Y.

RACKS—Wire Storage
Jarke Manufacturing Co., Chicago, Illinois

REEL AND TENSION STANDS—
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Co., Garrett, Ind.
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Nelson Company, The, Baltimore, Md.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS—Strip Steel
Steel Equipment Company, Cleveland, Ohio

REEL—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Boonton Molding Company, Boonton, N. J.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Nilson, A. H. Machine Co., Shelton, Conn.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Wood
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Nelson Company, The, Baltimore, Md.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Aluminum
Aluminum Company of America, Pittsburgh, Pa.

RODS—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Aluminum Company of America, Pittsburgh, Pa.
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Co., Phosphor Bronze Div., Seymour, Conn.

RODS—Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

SATURATION SYSTEMS—
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

SHEARS—Wire, Rod, Billet
Manco Mfg. Co., Bradley, Illinois

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SPOOLS—Plastic
Boonton Molding Company, Boonton, N. J.
Hubbard Spool Company, Garrett, Indiana
Standard Mill Supply, Co., Pawtucket, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STOCK STORAGE SYSTEMS
Jarke Manufacturing Co., Chicago, Illinois

STRAIGHTENERS—Portable Rod
Manco Mfg. Co., Bradley, Illinois

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

SWITCHES—Electronic Sensing
Winstrom, Northampton, Mass.

TABLES—Press Feeding
Jarke Manufacturing Co., Chicago, Illinois

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TESTERS—INSULATION
(See MACHINERY—Spark Testers)

TESTING EQUIPMENT
(See MACHINERY Testing, Physical and Diameter Testing)

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

TOOLS—Wire Cutting
Porter, H. K., Inc., Somerville, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Adjustable Speed Drives)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Bartell Machine-Tool Corporation, Rome, N. Y.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Hodge Bros. Machine Shop, Ossining, N. Y.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

VARNISHES & LACQUERS—for Electric Wire
General Electric Company, Alkanex Wire Enamel Dept., Schenectady, N. Y.
Shawinigan Resins Corporation, Springfield, Mass.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila, Pa.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt and Welding Wire Fabrics
Eisler Engineering Corp., Newark, N. J.
Micro Products Co., Chicago, Ill.
National Electric Welding Machines Co., Bay City, Michigan
Schlatter, H. A., Ltd., Zurich, Switzerland
Strecker, August, K.G., Limburg/Lahn, W. Germany

WHEELS—for Printing on Electric Wire
Gem Gravure Company, West Hanover, Mass.

WIRE—Aluminum
Aluminum Company of America, Pittsburgh, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Ball
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Barbed
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

WIRE—Brass and Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Company, Phosphor Bronze Div., Seymour, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Cadmium
Stamford Processing Co., Peekskill, N. Y.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Chase Brass & Copper Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—For Electrical Conductors
United Wire & Supply Corporation, Providence, R. I.

WIRE—Flat, Fine
Montgomery Co., The, Windsor Locks, Conn.
National Standard Company, Niles, Mich.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Galvanized
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
National Standard Company, Niles, Mich.
Roebling's, John A. Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—High Carbon
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Manufacturers
Aluminum Company of America, Pittsburgh, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Company, Phosphor Bronze Div., Seymour, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Metalizing
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WIRE—Music
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Worcester Wire Works Div., National-Standard Company, Worcester, Mass.

WIRE—Needle
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Alloy
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Malin & Co., The, Cleveland, Ohio
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Seymour Mfg. Co., Phosphor Bronze Div., Seymour, Conn.
United Wire & Supply Corporation, Providence, R. I.

WIRE—Oil Tempered
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Special Shapes
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Spring
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Roebling's John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Crucible Steel Co. of America, Pittsburgh, Pa.
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Steel—Also Coppered and Galvanized Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
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Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WOOD—for Guide, Rolls, Bushings. Wear Parts, etc.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

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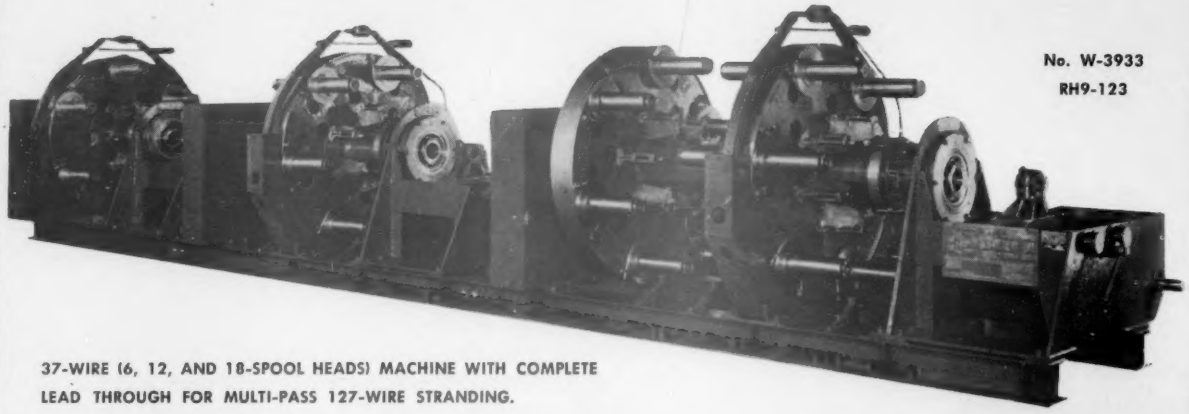

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1958 **1958**

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SUN	MON	TUE	WED	THU	FRI	SAT
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5	6	7	8	9	10	11
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FEBRUARY

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OCTOBER

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DECEMBER

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